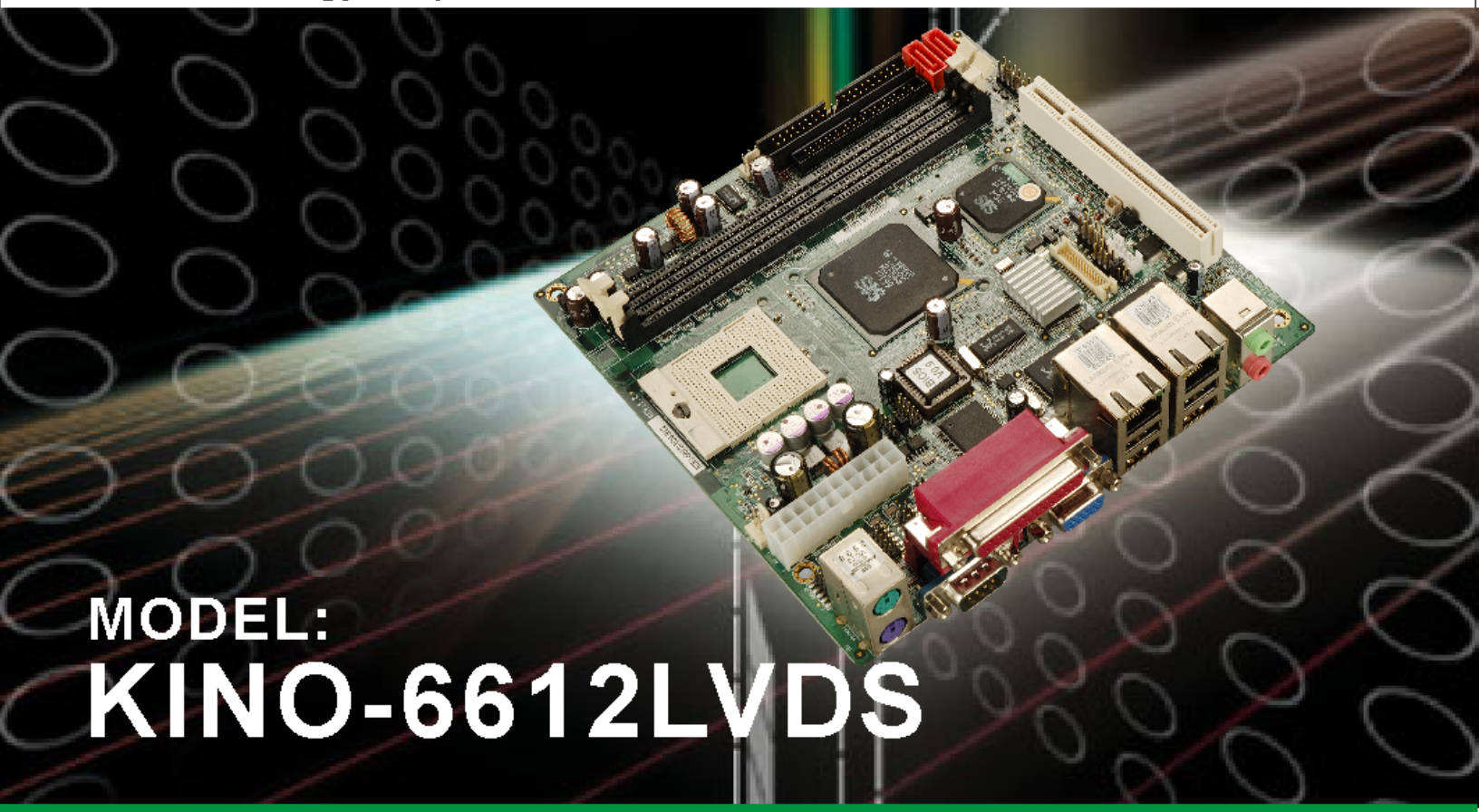
IEI Technology Corp.



MODEL:

KINO-6612LVDS

Socket 479 Intel® Pentium® M Mini-ITX Motherboard With a 400 MHz or 500 MHZ FSB and 2.26 GHz Clock Speed Dual SATA, Dual PCI GbE, Audio, LVDS and TV-OUT

User Manual

Rev. 1.30 AUGUST 2008

RoHS Lead Free

Revision

Date	Version	Changes
2007-08-14	V1.30	Removed TPM connector BIOS support on the LPC bus -12 V added to PCI slot
2007-11-29	1.12	Changed in accordance with Quick Installation Guide changes
2007-11-01	1.1	Removed the 800Z models and changed the LVDS connector pin definitions
2007-05-01	1.0	Initial release

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Manual Conventions

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:

WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the KINO-6612 or personal injury to the user. Please take warning messages seriously.

CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the KINO-6612. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The italicized text is the cautionary message. A caution message is shown below:

CAUTION:

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the KINO-6612. Please take caution messages seriously.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the KINO-6612. Please take note messages seriously.

Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the KINO-6612 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the KINO-6612 package.

- 1 x KINO-6612 Single Board Computer
- 1 x Mini Jumper Pack
- 1 x ATA66/100 Flat Cable
- 2 x SATA cable
- 1 x SATA Power cable
- 1 x I/O Shielding
- 1 x Utility CD
- 1 x QIG

Images of the above items are shown in **Chapter 3**.

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: KINO-6612 Mini-ITX CPU Card

1.1.1 KINO-6612 Introduction

The KINO-6612 Mini-ITX motherboard (**Figure 1-1**) is a socket 479 Intel® Pentium® M or Celeron® M CPU platform. This high performance platform supports a front side bus (FSB) of 400 MHz or 533 MHz and processors with maximum clock speed of 2.26 GHz. Two DIMM sockets support two 1.0 GB (max.) 184-pin DDR DIMM for a maximum system memory of 2.0 GB.

The KINO-66112 features multiple display options including CRT, LVDS and TV-OUT. The KINO-66112 also features flexible storage options include two 1.5 Gbps SATA drives and two IDE connectors (one 40-pin and the other 44-pin). Each IDE connector can connect two devices providing connectivity to four hard disk drives (HDD). One PCI slot and support for six USB 2.0 devices provide increased system expansion and flexibility. Dual PCI Express (PCIe) Gigabit Ethernet (GbE) controllers provide network capabilities to the KINO-6612.

1.1.2 KINO-6612 Model Variations

Table 1-1 shows the model variations that are available:

Feature	KINO-6612	KINO-6612LVDS
533 MHz FSB	Yes	Yes
VGA	Yes	Yes
LVDS	No	Yes
TV-OUT	No	Yes
Dual PCI GbE	Yes	Yes
Audio	Yes	Yes
Dual SATA	Yes	Yes

Table 1-1: Model Variations

1.2 KINO-6612 Overview

1.2.1 KINO-6612 Overview Photo

The KINO-6612 has a wide variety of peripheral interface connectors. **Figure 1-2** is a labeled photo of the peripheral interface connectors on the KINO-6612.

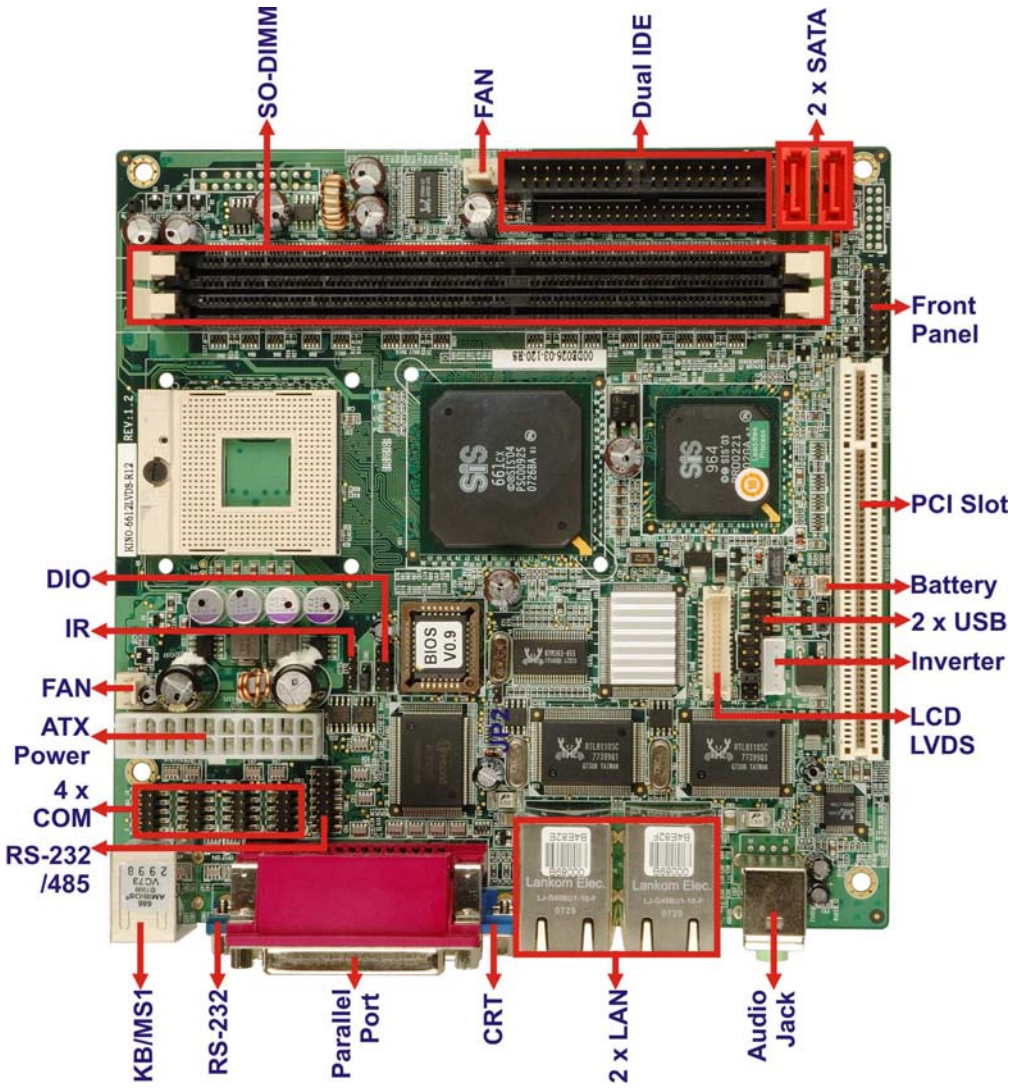


Figure 1-2: KINO-6612 Overview [Front View]

1.2.2 KINO-6612 Peripheral Connectors and Jumpers

The KINO-6612 has the following connectors on-board:

- 1 x 20-pin ATX power connector
- 1 x Backlight inverter connector
- 1 x CompactFlash® socket
- 2 x Fan connectors
- 2 x Front panel connectors (one is optional)
- 1 x General purpose input/output (GPIO) connector

- 2 x IDE disk drive connectors (one 40-pin and one 44-pin)
- 1 x Infrared interface (IrDA) connector
- 1 x LVDS connector
- 1 x PCI slot
- 2 x Serial ATA II (SATA II) drive connectors
- 4 x RS-232 serial port connectors
- 1 x RS-232/422/485 serial port connector
- 1 x TV Out connector
- 1 x USB 2.0 connectors (supports two USB 2.0 devices)

The KINO-6612 has the following external peripheral interface connectors on the board rear panel.

- 2 x Audio Jacks
- 2 x Ethernet connectors
- 1 x Parallel port (LPT) connector
- 2 x PS/2 connectors
- 1 x Serial port connector
- 4 x USB connectors
- 1 x VGA connector

The KINO-6612 has the following on-board jumpers:

- Clear CMOS
- CF card setup
- CPU frequency select
- FSB frequency select
- LCD voltage setup
- RS-232/422/485 COM2 setup

1.2.3 Technical Specifications

KINO-6612 technical specifications are listed in **Table 1-2**. See **Chapter 2** for details.

Specification	KINO-6612
Form Factor	Mini-ITX
System CPU	Socket 479 Intel® Pentium® M Socket 479 Intel® Celeron® M
Front Side Bus (FSB)	400 MHz or 533 MHz
System Chipset	Northbridge: SIS661CX Southbridge: SIS964
Memory	Two 184-pin DDR DIMM sockets support two 1.0GB (maximum) DIMM modules with clock speeds of 400MHz or 533MHz
Super I/O	Winbond W83697HG
Display	Analog VGA integrated on the SiS661CX and interfaced through an external DB-15 connector 24-bit dual-channel LVDS by SiS 302LV on (KINO-6612LVDS only) TV-OUT integrated in the SiS302LV
BIOS	AMI BIOS label SPI EEPROM 8.0 MB
Audio	AC'97 codec with Realtek ALC655
LAN	Two Realtek RTL8110S GbE controllers

COM	One RS-232 serial port through an external DB-9 connectors Four RS-232/422/485 serial ports through 10-pin pin headers One RS-232/422/485 serial port through 14-pin pin header
USB2.0	Six USB 2.0 devices supported: ■ Two by onboard pin-headers ■ Four by external connectors
Hard Drives	One 40-pin IDE connector and one 44-pin IDE connector connect to four Ultra ATA33/66/100/133 devices
SATA	Two 1.5 Gbps SATA drives supported
SATA RAID Levels	RAID 0, RAID 1, RAID 10 and JBOD
Keyboard/mouse	Two external PS/2 connectors
Parallel Port	One 26-pin external parallel port connector
Expansion	One PCI expansion slot
Digital I/O	One8-bit digital input/output connector; 4-bit input/4-bit output through the Winbond W83697HG super I/O
Watchdog Timer	Software programmable 1-255 sec. through the Winbond W83697HG super I/O
Infrared	One IrDA connector through the Winbond W83697HG super I/O. Supports: ■ Serial Infrared (SIR) ■ Amplitude Shift Keyed IR (ASKIR)
Power Supply	20-pin ATX power connector
Fan Connector	Two fan connectors

Power Consumption	5V@3.79A, +12V@1.44A and 3.3V@0.92A (1.5 GHz Intel® Celeron® M CPU with one 400 MHz 1.0 GB DDR DIMM)
Temperature	0ºC – 60ºC (32ºF - 140ºF)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	170mm x 170mm
Weight (GW/NW)	1,100g/420g

Table 1-2: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Dimensions

2.1.1 Board Dimensions

The dimensions of the board are listed below:

- **Length**: 170mm
- **Width**: 170mm

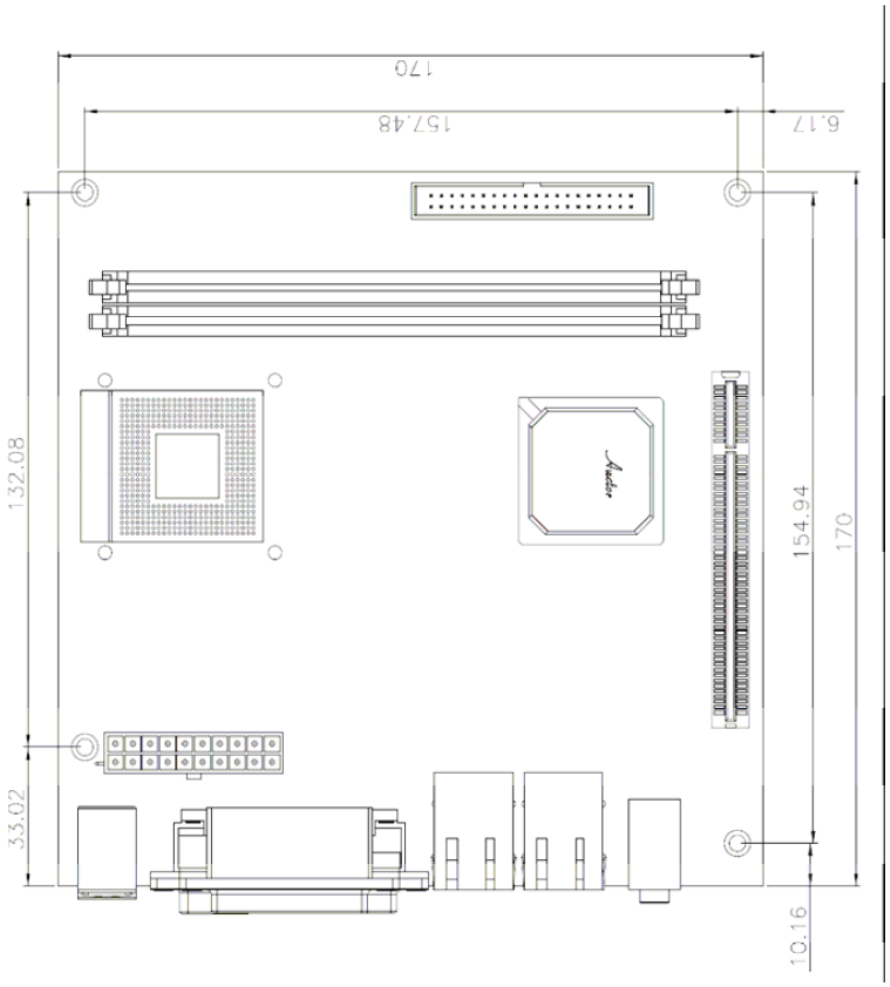


Figure 2-1: KINO-6612 Dimensions (mm)

2.1.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

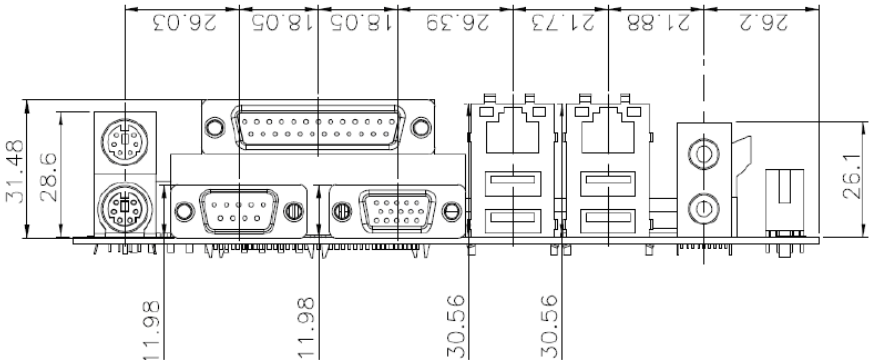


Figure 2-2: External Interface Panel Dimensions (mm)

2.2 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

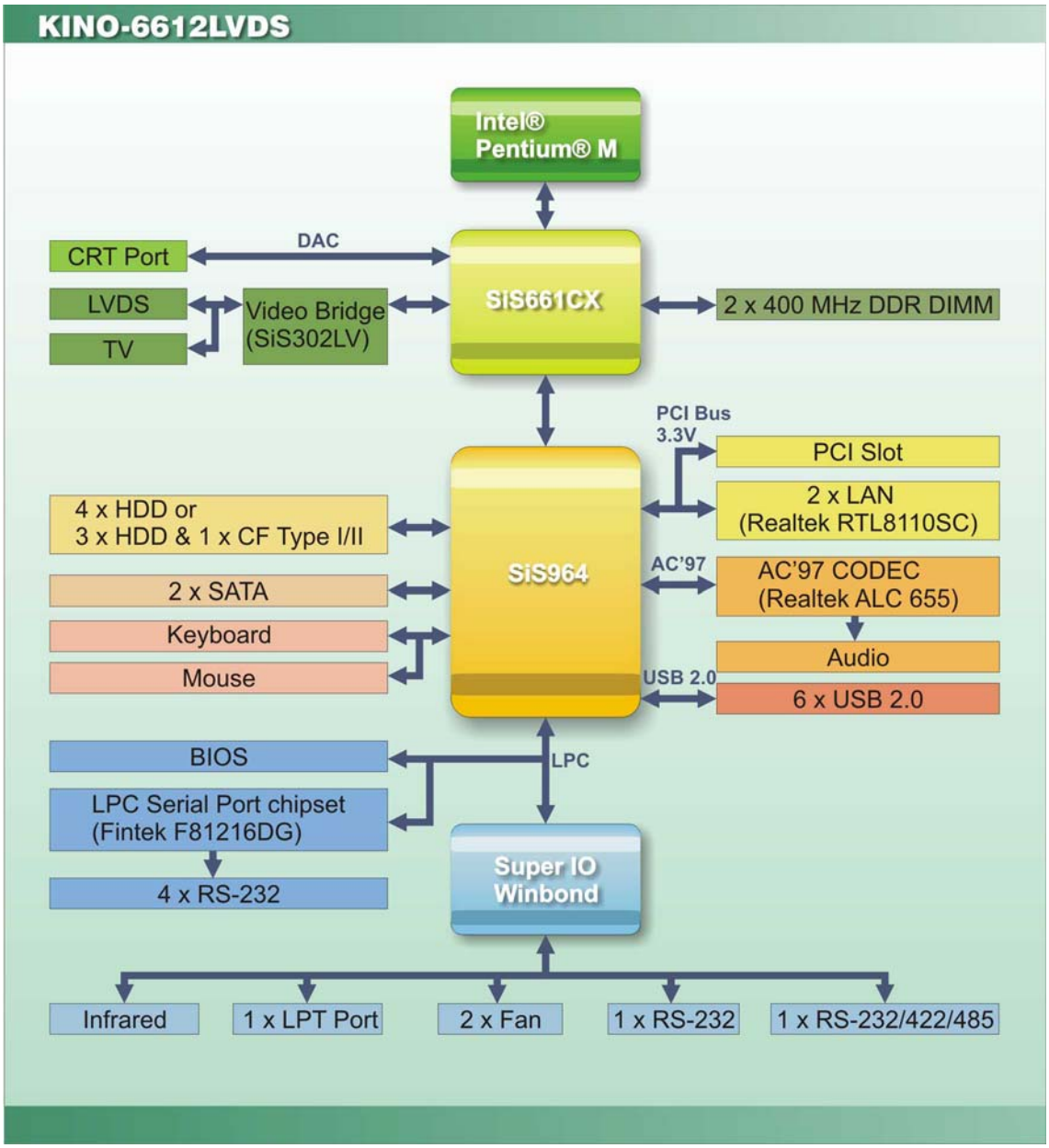


Figure 2-3: Data Flow Block Diagram

2.3 Compatible Processors

2.3.1 Supported Processors

The KINO-6612 supports the following Socket 479 Intel® processors:

- Intel® Pentium® M

- Intel® Celeron® M

The CPU socket is shown is show below:

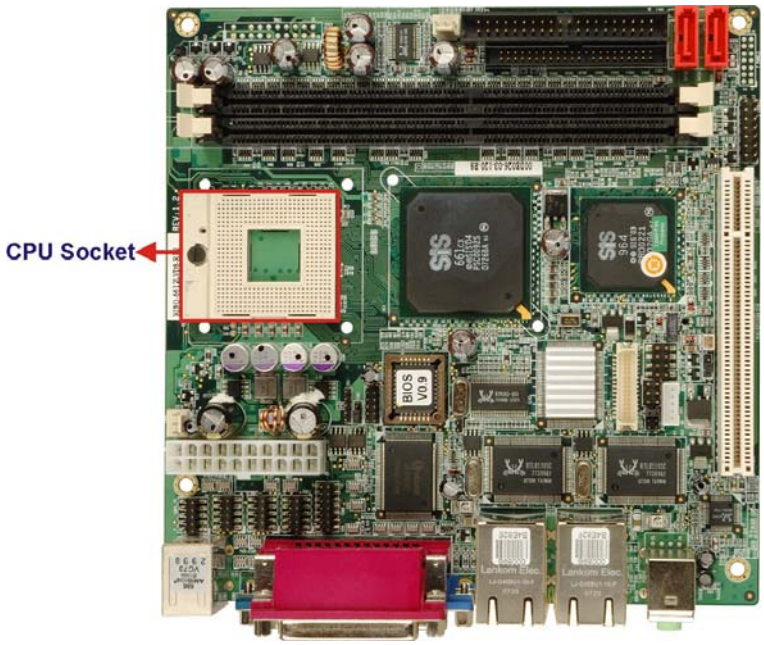


Figure 2-4: CPU Socket

2.3.2 Intel® Pentium® M Processors

The KINO-6612 supports the Intel® Pentium® M processors listed in **Table 2-1** below.

CPU Speed	Processor #	Bus Speed	Mfg Tech	Cache Size
2.26 GHz	780	533 MHz	90 nm	2 MB
2 GHz	760	533 MHz	90 nm	2 MB
2 GHz	755	400 MHz	90 nm	2 MB
1.80 GHz	745	400 MHz	90 nm	2 MB
1.80 GHz	745	400 MHz	90 nm	2 MB
1.73 GHz	740	533 MHz	90 nm	2 MB

1.70 GHz	735	400 MHz	90 nm	2 MB
1.60 GHz	730	533 MHz	90 nm	2 MB
1.60 GHz	725	400 MHz	90 nm	2 MB
1.50 GHz	715	400 MHz	90 nm	2 MB

Table 2-1: Support Intel® Pentium® M Processors

2.3.3 Intel® Celeron® M Processors

The KINO-6612 supports the Intel® Celeron® M processors listed in Table 2-2 below.

CPU Speed	Processor #	Bus Speed	Mfg Tech	Cache Size
1.70 GHz	390	400 MHz	90 nm	1 MB
1.60 GHz	380	400 MHz	90 nm	1 MB
1.50 GHz	340	400 MHz	0.13 micron	512 KB
1.50 GHz	370	400 MHz	90 nm	1 MB
1.50 GHz	370	400 MHz	90 nm	1 MB
1.40 GHz	360	400 MHz	90 nm	1 MB
1.40 GHz	360	400 MHz	90 nm	1 MB
1.40 GHz	360	400 MHz	90 nm	1 MB
1.30 GHz	320	400 MHz	0.13 micron	512 KB
1.30 GHz	350	400 MHz	90 nm	1 MB

1.30 GHz	350	400 MHz	90 nm	1 MB
1.20 GHz	310	400 MHz	0.13 micron	512 KB

Table 2-2: Supported Intel® Celeron® M Processors

2.3.4 Front Side Bus (FSB)

The Intel® processor on the KINO-6612 is interfaced to the SiS661CX Northbridge through an 800 MHz front side bus (FSB). The FSB is shown in **Figure 2-5** below.

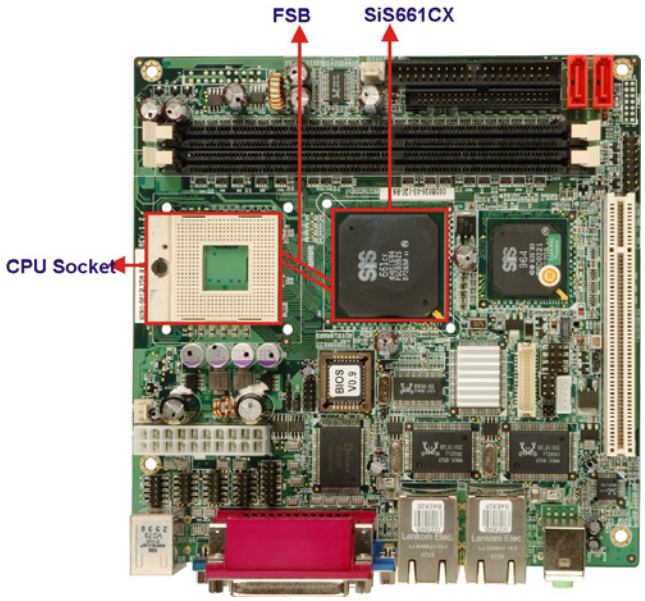


Figure 2-5: Front Side Bus

2.4 SiS661CX Northbridge Chipset

2.4.1 SiS661CX Overview

The SiS661CX Northbridge chipset supports Socket 479 Intel® Pentium® M and Intel® Celeron® M processors. The SiS661CX is interfaced to the processor through an 800 MHz FSB clock with a 3.2 GBps transfer bandwidth, stable high-speed computing

functions and multiple RAM formats such as 400 MHz. 333 MHz and 266 MHz DDR. The SiS661CX ECLK and 1600 x 1200 high resolution can support UXGA TFT-LCD output.

2.4.2 DDR Controller

There are twp 184-pin DDR DIMM sockets on the KINO-6612. These sockets support to DDR DIMM with the following specifications:

- 333 MHz or 400 MHz un-buffered DIMM
- 1.0 GB maximum capacity per DIMM (2.0 GB maximum system memory)
- Dynamic Clock Enable (CKE)

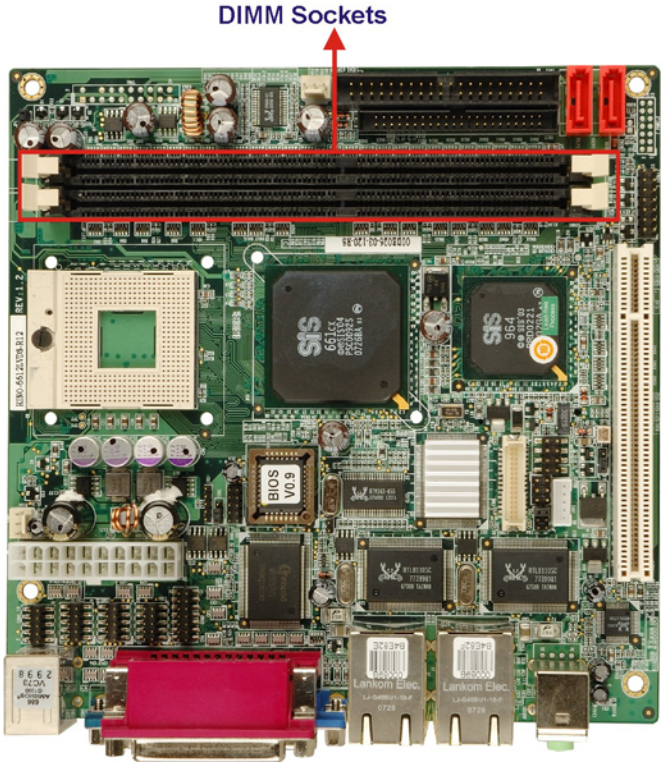


Figure 2-6: DDR DIMM Sockets

2.4.3 Graphics Support Mode

The graphics controller supports the following maximum resolutions:

- CRT highest resolution mode: 2048x1536x32 @ 75NI
- LCD highest resolution mode: 1600x1200x32 @ 60NI
- TV highest resolution mode: 1024x768x32 @60NI

2.4.4 Integrated Graphics Engine

The integrated graphics is a high performance 256-bit 3D or 128-bit 2D graphics engine with two, pixel rendering, pipelines and four texture units per cycle (2P4T) with an ECLK of up to 200 MHz.

2.4.5 SiS302LV Video Bridge

2.4.5.1 SiS302LV Video Bridge

The SiS302LV video bridge is interfaced to the SiS661CX through the SiS video interface. The SiS302LV video bridge provides connectivity to both TV signals and LVDS signals. The video Interface bus is shown in **Figure 2-7**.

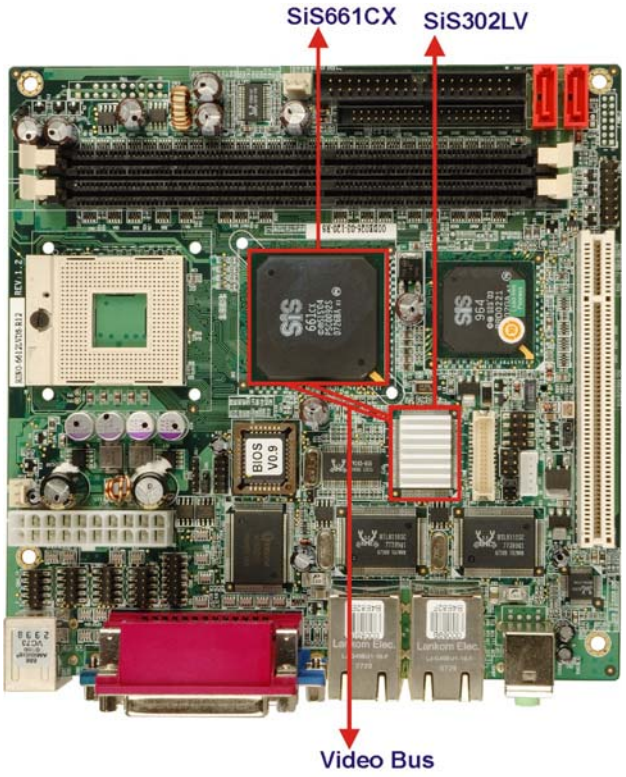


Figure 2-7: Video Interface Bus

2.4.5.2 SiS302LV Video Bridge TV Display Features

Some of the TV display features supported by the SiS302LV are listed below.

- PAL and NTSC systems with resolutions up to 1024x768
- Composite, S-Video and Component output signals
- Macrovision copy protection process rev. 7.1.L1
- Progressive TV 480p YPbPr output signal
- Macrovision copy protection waveforms for 480p progressive scan output
- TV/primary VGA independent display resolution and frame rate at enhanced mode
- Adaptive 6-Line anti-flicker filtering
- Hardware interpolation for programmable under-scan/over-scan adjustment
- Programmable display position adjustment
- Programmable notch filter for cross color elimination
- Chrominance filter for cross luminance elimination
- Color saturation adjustment for vivid TV output
- Gamma correction independent of that of primary VGA
- Auto-sense of TV connection

2.4.5.3 SiS302LV Video Bridge LVDS Display Features

Some of the LVDS display features supported by the SiS302LV are listed below.

- LVDS transmitter function
- Dual link LVDS resolution up to 1920x1600
- TIA/EIA-644 LVDS standard
- Bi-linear scaling to scale VGA low resolution mode up to 1600x1200 for LCD display
- LCD/primary VGA independent display resolution and frame rate at enhanced mode
- 2D dither for 18-bit panels
- Programmable display centering
- Compliant with VESA DDC2B
- Compliant with VESA plug & display, hot plugging function
- Gamma corrections independent of that of primary VGA

2.4.5.4 Dual Display

The LVDS and TV windows driver supports dual display. When the TV and LCD are in the simultaneous display mode, the TV data stream runs through Channel B and the LCD data stream run through Channel A.

2.4.6 SiS MuTIOL® 1G Northbridge-to-Southbridge Bus

The proprietary SiS MuTIOL® 1G bus is 1.0 GBps link between the SiS661CX Northbridge and the SiS964 Southbridge. The SiS MuTIOL® 1G bus is a bi-directional 16-bit data bus with an operating frequency of 533 MHz Operating Frequency.

2.5 SIS964 Southbridge Chipset

2.5.1 SIS964 Southbridge Overview

The SiS964 Southbridge integrates one USB 2.0 host controller and three USB 1.1 controllers, an audio controller with an AC'97 Interface, IDE master/slave controllers, and two serial ATA host controllers with SiS MuTIOL® 1G technology. The SiS964 also includes a PCI to LPC bridge, an I/O Advanced Programmable Interrupt Controller, legacy system I/O and legacy power management functionalities. The SIS964 is interfaced to the SIS661CX bus through the 1GB/s SiS MuTIOL® 1G bus.

2.5.2 SiS964 Audio Codec ’97 Controller

The integrated AC'97 v2.3 compliant audio controller is interfaced to a Realtek ALC655 audio codec. The Realtek ALC655 is in turn connected to two external audio jacks.

2.5.2.1 Realtek ALC655 AC’97 Audio Codec

The Realtek ALC655 AC’97 audio codec is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio codec and is interfaced to two external audio jacks. The codec and the audio connectors are shown in **Figure 2-8**.

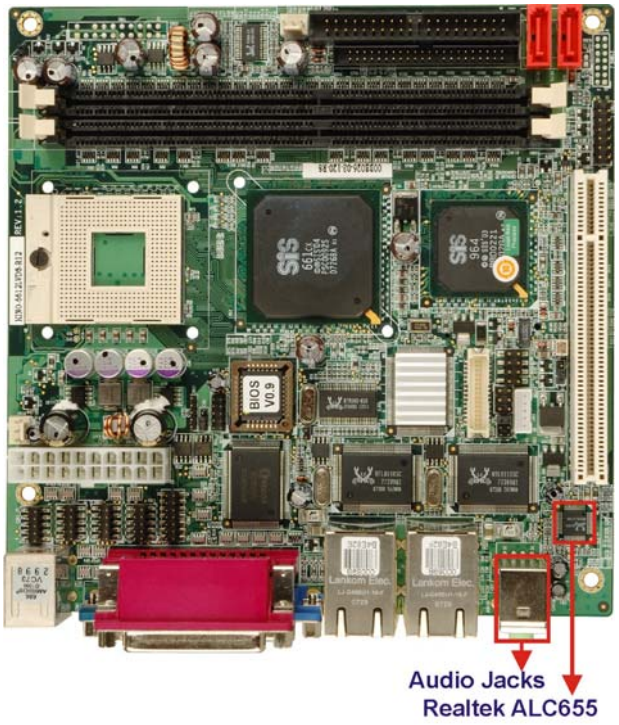


Figure 2-8: Audio Codec and Connectors

Some of the features of the Realtek ALC655 are listed below:

- Meets performance requirements for audio on PC99/2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
  - Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
  - 14.318MHz -> 24.576MHz PLL to eliminate crystal
  - 12.288MHz BITCLK input
  - Integrated PCBEEP generator to save buzzer
  - Interrupt capability
- Three analog line-level stereo inputs with 5-bit volume control, LINE_IN, CD, AUX
- High-quality differential CD input
- Two analog line-level mono inputs: PCBEEP, PHONE-IN
- Two software selectable MIC inputs
- Dedicated Front-MIC input for front panel applications (software selectable)

- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output
- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function
- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- Standard 48-pin LQFP package
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D positional audio
- 10-band software equalizer SIS964 PCIe x1 Bus

2.5.3 SiS964 IDE Controllers

One 40-pin IDE connector and one 44-pin IDE connector on the KINO-6612 connect to four IDE devices and are directly interfaced to an IDE Master and IDE Slave controller on the SIS964 Southbridge chipset. The controllers support PIO mode 0, 1, 2, 3, 4 and hard drives with the following specifications.

- **Ultra ATA/133**, with data transfer rates up to 133MB/s
- **Ultra ATA/100**, with data transfer rates up to 100MB/s
- **Ultra ATA/66**, with data transfer rates up to 66MB/s
- **Ultra ATA/33**, with data transfer rates up to 33MB/s

The IDE connector is shown in Figure 2-9 below.

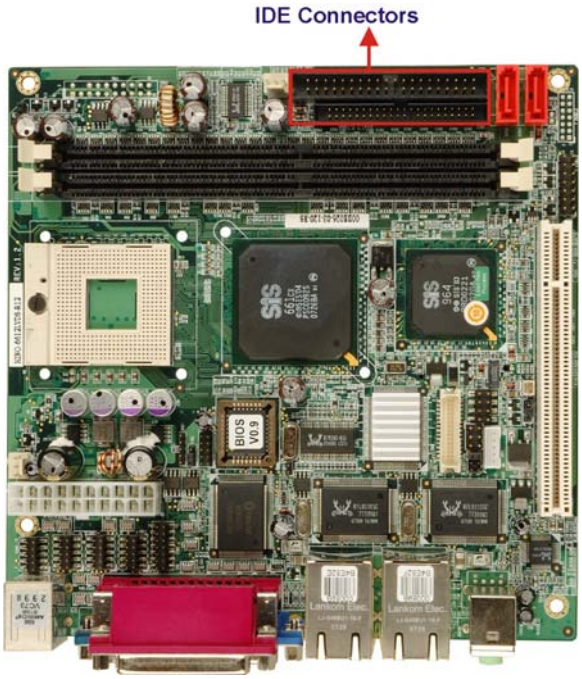


Figure 2-9: IDE Connector

2.5.4 SiS964 LPC host bus controller

The SIS964 Southbridge LPC interface complies with the LPC 1.1 specifications. The LPC bus from the Southbridge is connected to the following components:

- BIOS chipset
- Super I/O chipset
- LPC Serial Port Chipset

2.5.5 SiS964 PCI Host Bus Controller

The PCI interface on the SIS964 Southbridge is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI rev. 2.3 specifications
- PCI bus at 33 MHz
- Up to 6 master devices
- 40-bit addressing
- Interrupt steering for plug-n-play devices
- Concurrent PCI operations

- Hiding of PCI devices by BIOS/hardware
- Spread spectrum

2.5.6 SiS694 Real Time Clock

The SiS964 Real Time clock has 512B CMOS SRAM.

2.5.7 SIS964 SATA Controllers

Two SATA ports on the KINO-6612 are interfaced to an integrated SATA Host controller on the SiS964. The SATA Host controller complies with SATA 1.0 specifications and has data transmission rates of up to 1.5 Gbps. The SATA host controller also complies with AHCI 1.0 specification with software providing transparent switching between the legacy interface and the AHCI interface. The SATA connectors are shown in **Figure 2-10**.

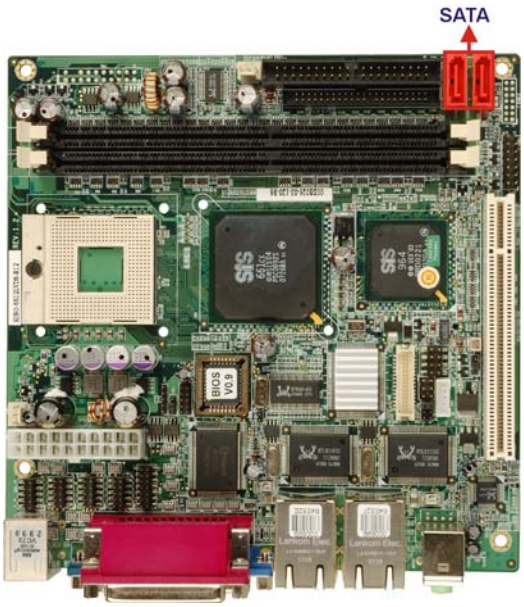


Figure 2-10: SATA Connectors

2.5.8 Keyboard and Mouse Controller

The hardwired keyboard controller and PS/2 mouse interface on the SiS964 Southbridge are interfaced directly to two external PS/2 connectors one each for a keyboard and a mouser. The keyboard and mouse connectors are shown in **Figure 2-11**.

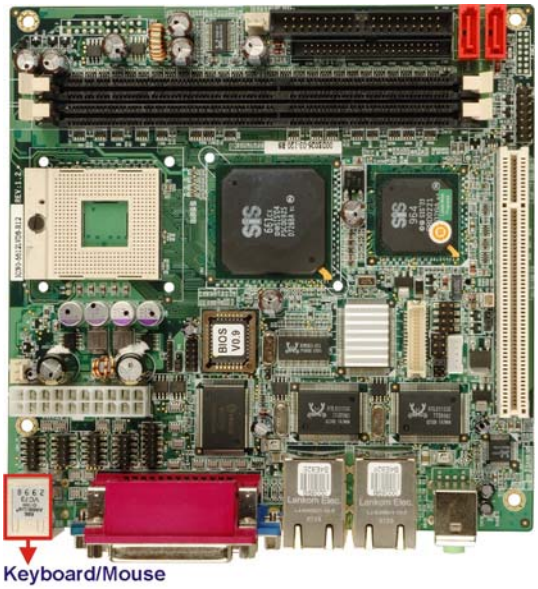


Figure 2-11: Keyboard and Mouse Connectors

2.5.9 SIS964 USB Controllers

The USB controllers on the SiS 964 Southbridge chipset are interfaced to six USB 1.1 or USB 2.0 devices. Four USB devices can be connected to external USB ports. The remaining two USB devices are connected to a single onboard USB connectors. The SiS964 USB features are listed below:

- One EHCI USB 2.0 controller
- Three OHCI USB 1.1 controllers
- Eight USB 2.0 or USB 1.1 devices supported
- USB 2.0 high-speed devices with 480 Mb/s transfer rates supported

The six USB ports implemented on the KINO-6612 are connected to one internal connector and four external connectors. See Figure 2-12.

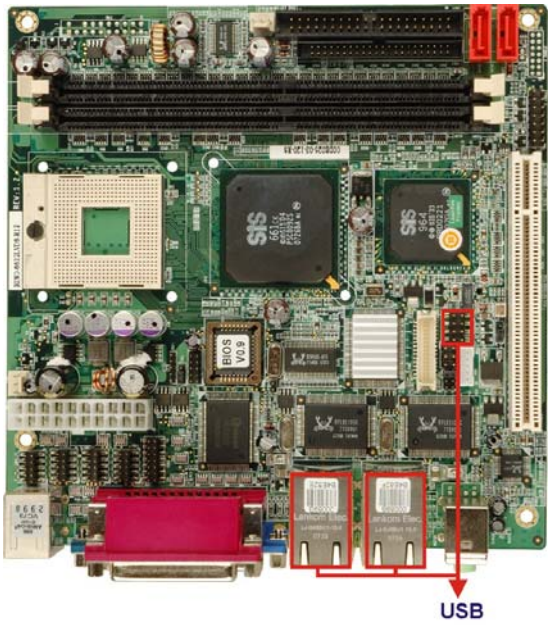


Figure 2-12: USB Connectors

2.6 LPC Bus Components

2.6.1 LPC Bus Overview

The SIS964 LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset
- LPC Serial Port Chipset

2.6.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

The BIOS chipset is shown in **Figure 2-13** below.

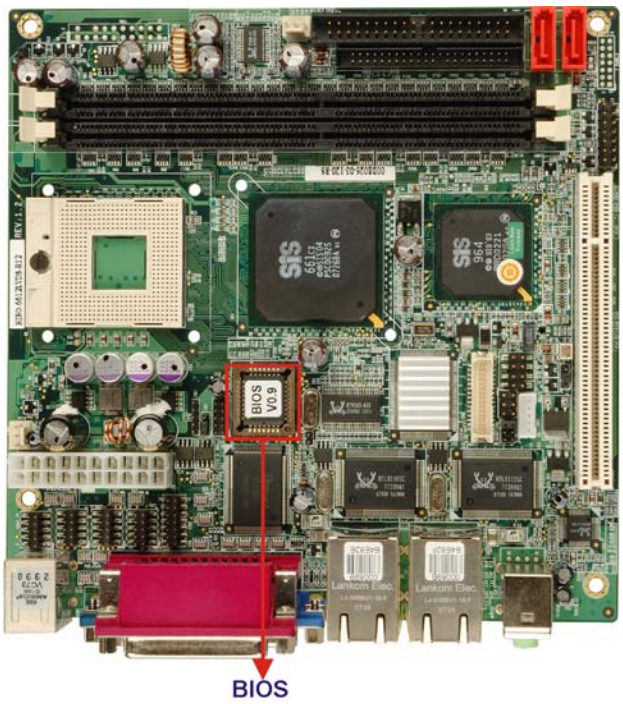


Figure 2-13: BIOS Chipset

2.6.3 Winbond W83697HF Super I/O chipset

The Winbond W83697HF Super I/O chipset is connected to the SiS964 Southbridge through the LPC bus.

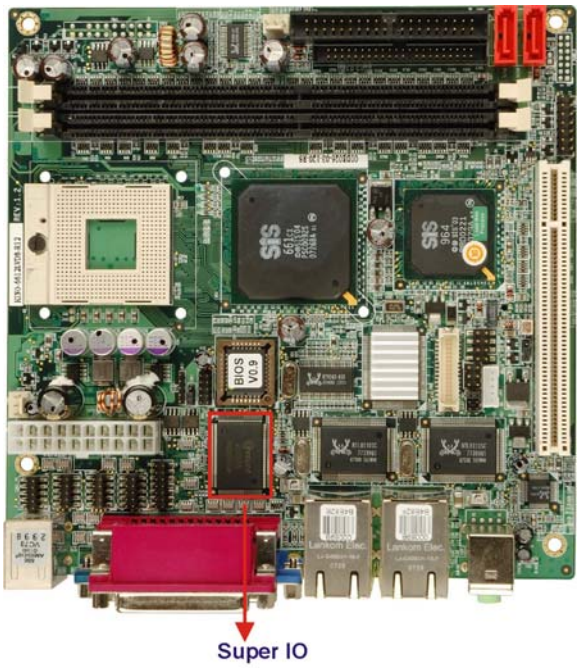


Figure 2-14: Super I/O Chipset

The Winbond W83697HF is an LPC interface-based Super I/O device that comes with Environment Controller integration, floppy disk controller, UART controller and IR controller. Some of the features of the Winbond W83697HF chipset are listed below:

- LPC Spec. 1.01 compliant
- LDRQ# (LPC DMA) and SERIRQ (serial IRQ) supported
- Hardware monitor functions integrated
- Microsoft PC98/PC99 Hardware Design Guide compliant
- ACPI DPM (Device Power Management) supported

Some of the Super I/O features are described in more detail below:

2.6.3.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.01. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.6.3.2 Super I/O Infrared

The onboard Super I/O supports the following infrared specifications:

- IrDA version 1.0 SIR protocol with a maximum baud rate up to 115.2Kbps
- Supports SHARP ASK-IR protocol with maximum baud rate of 57,600bps

The infrared controller on the super I/O is interfaced through the board-to-board connectors on the KINO-6612 to an infrared pin-header on a backplane.

2.6.3.3 Super I/O Hardware Monitor Functions

The Super I/O Hardware Monitor monitors internal voltages, system temperature and the cooling fan speed. All the monitored environmental parameters can be read from the BIOS Hardware Health Configuration menu.

2.6.3.4 Super I/O Fan Speed and Fan Control

The super I/O can both monitor and control the fan speed. The super I/O is interfaced to the fan on the backplane through the board-to-board connectors.

2.6.3.5 Super I/O UART

Two 16550 UART controllers on the super I/O are interfaced to one external RS-232 serial port connector and one onboard RS-232/422/485 pin-header connector. Some of the features of the UART are listed below:

- 16-byte send/receive FIFO
- MIDI compatible
- Fully programmable serial interface characteristics
  - 5, 6, 7 or 8 bit characters
  - Even, odd or no parity bit generation detection
  - 1, 1.5 or 2 bits stop generation
- Internal diagnostic capabilities
- Maximum baud rate up to 921 kbps for 14.769 MHz and 1.5 Mbps for 24 MHz

2.6.4 Fintek F81216D LPC Serial Port Chipset

The KINO-6612 has a Fintek F81216D chipset onboard that enables the addition of four additional UART serial ports (COM3, COM4, COM5 and COM6). UART includes 16-byte send/receive FIFO. The Fintek serial port chipset is interfaced to the Southbridge chipset through the LPC bus. Some of the features of the Fintek chipset are listed below:

- Supports LPC interface
- Totally provides 4 UART (16550 asynchronous) ports
  - 1 x Pure UART
  - 1 x UART+IR
- One Watch dog timer with WDTOUT# signal
- One Frequency input 24/48MHz
- Powered by 3Vcc

The Fintek is interfaced to four RS-232 onboard serial port connectors.

2.7 PCI Bus Components

2.7.1 PCI Bus Overview

The PCI interface on the SIS964 Southbridge is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI rev. 2.3 specifications
- PCI bus at 33 MHz
- Up to 6 master devices
- 40-bit addressing
- Interrupt steering for plug-n-play devices
- Concurrent PCI operations
- Hiding of PCI devices by BIOS/hardware
- Spread spectrum
- LPC Serial Port Chipset

The PCI bus is connected to the following components:

- 1 x PCI slot

- 2 x PCI GbE controllers

2.7.2 PCI Slot

One PCI lanes is connected to a single PCI slot for PCI expansion. See **Figure 2-15** below.

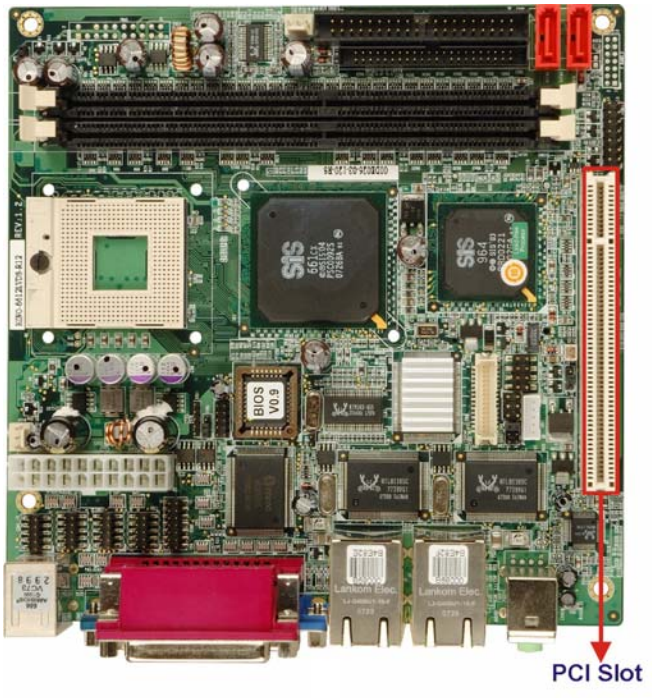


Figure 2-15: PCI Slot

2.7.3 PCI GbE Controllers

Two PCI lanes are connected to two Realtek RTL8110SC GbE controllers shown in **Figure 2-16** below.

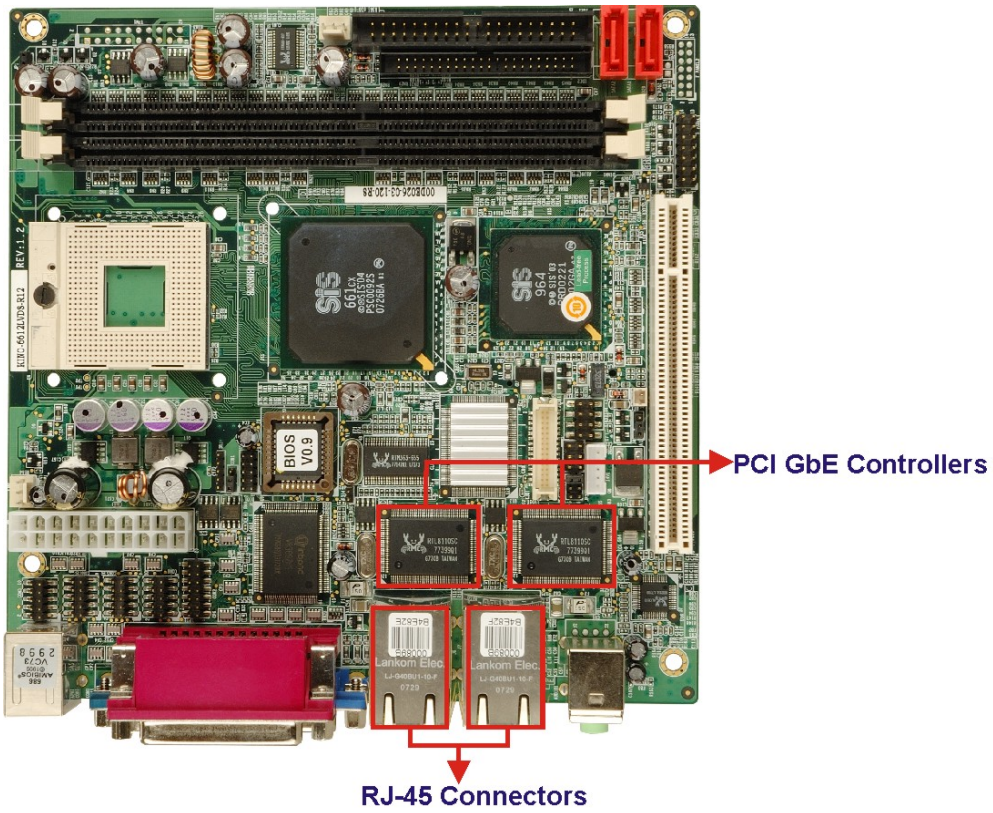


Figure 2-16: Realtek PCI GbE Controllers

The Realtek RTL8110SC PCI GbE controllers combine a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, 32-bit PCI bus controller, and embedded memory. With state-of-the-art DSP technology and mixed-mode signal technology, they offer high-speed transmission over CAT 5 UTP cable or CAT 3 UTP (10Mbps only) cable. Functions such as Crossover Detection & Auto-Correction, polarity correction, adaptive equalization, cross-talk cancellation, echo cancellation, timing recovery, and error correction are implemented to provide robust transmission and reception capability at high speeds.

Some of the features of the Realtek RTL8110SC PCI GbE controllers are listed below.

- Integrated 10/100/1000 transceiver
- Auto-Negotiation with Next Page capability
- Supports PCI rev.2.3, 32-bit, 33/66MHz

- Supports pair swap/polarity/skew correction
- Crossover Detection & Auto-Correction
- Wake-on-LAN and remote wake-up support
- Microsoft® NDIS5 Checksum Offload (IP, TCP, UDP) and largesend offload support
- Supports Full Duplex flow control (IEEE 802.3x)
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
- Supports IEEE 802.1P Layer 2 Priority Encoding
- Supports IEEE 802.1Q VLAN tagging
- Serial EEPROM
- 3.3/1.8/1.5V signaling, 5V PCI I/O tolerant
- 0.15µm CMOS process
- Transmit/Receive FIFO (8K/64K) support
- Supports power down/link down power saving
- Supports PCI Message Signaled Interrupt (MSI)

2.8 Environmental and Power Specifications

2.8.1 System Monitoring

Two thermal inputs on the KINO-6612 Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- System temperature
- CPU temperature

Eight voltage inputs on the KINO-6612 Super I/O Enhanced Hardware Monitor monitor the following voltages:

- Vcore
- +3.3Vin
- +5.0Vin
- +12.0Vin

The KINO-6612 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.8.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the KINO-6612 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the northbridge and southbridge chipsets to ensure the operating temperature of these chips remain low.

2.8.3 Power Consumption

Table 2-3 shows the power consumption parameters for the KINO-6612 running with a 1.5 GHz Intel® Celeron® M with 1.0 GB of 400MHz DDR memory.

Voltage	Current
+3.3V	0.92A
+5V	3.79A
+12V	1.44A

Table 2-3: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING!

Failure to take ESD precautions during the installation of the KINO-6612 may result in permanent damage to the KINO-6612 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-6612. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-6612, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the KINO-6612, place it on an antic-static pad. This reduces the possibility of ESD damaging the KINO-6612.
- ***Only handle the edges of the PCB***:- When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the KINO-6612 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the KINO-6612 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the KINO-6612 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

3.3.1 Package Contents

The KINO-6612 is shipped with the following components:

Quantity	Item and Part Number	Image
1	KINO-6612	
1	40p/40p/40p HDD flat cable (**P/N**: 32200-000052-RS)	
1	44p/44p HDD cable flat cable (**P/N**: 32200-000009-RS)	
2	SATA cable (**P/N**: 32000-062800-RS)	
1	SATA power cable (**P/N**: 32100-088600-RS)	

2	Dual RS-232 cable (**P/N**: 32200-028401-RS)	
1	I/O Shielding (**P/N**: 45002-450903-00-RS)	
1	Mini jumper pack (2.0mm) (**P/N**:33100-000033-RS)	
1	Utility CD	
1	Quick Installation Guide	

3.3.2 Optional Items

The KINO-6612 is shipped with the following components:

Item and Part Number	Image
TV Out Cable (**P/N**:19800-000056-RS)	
CPU cooler (**P/N**: CF-479B-RS)	

Dual RS-232 cable (**P/N**: 32200-000077-RS)	
Dual USB cable (w bracket) (**P/N**: CB-USB02-RS)	

Chapter

4

Connectors

4.1 Peripheral Interface Connectors

Section 4.2 shows peripheral interface connector locations. Section 4.2 lists all the peripheral interface connectors seen in Section 4.2.

4.1.1 KINO-6612 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

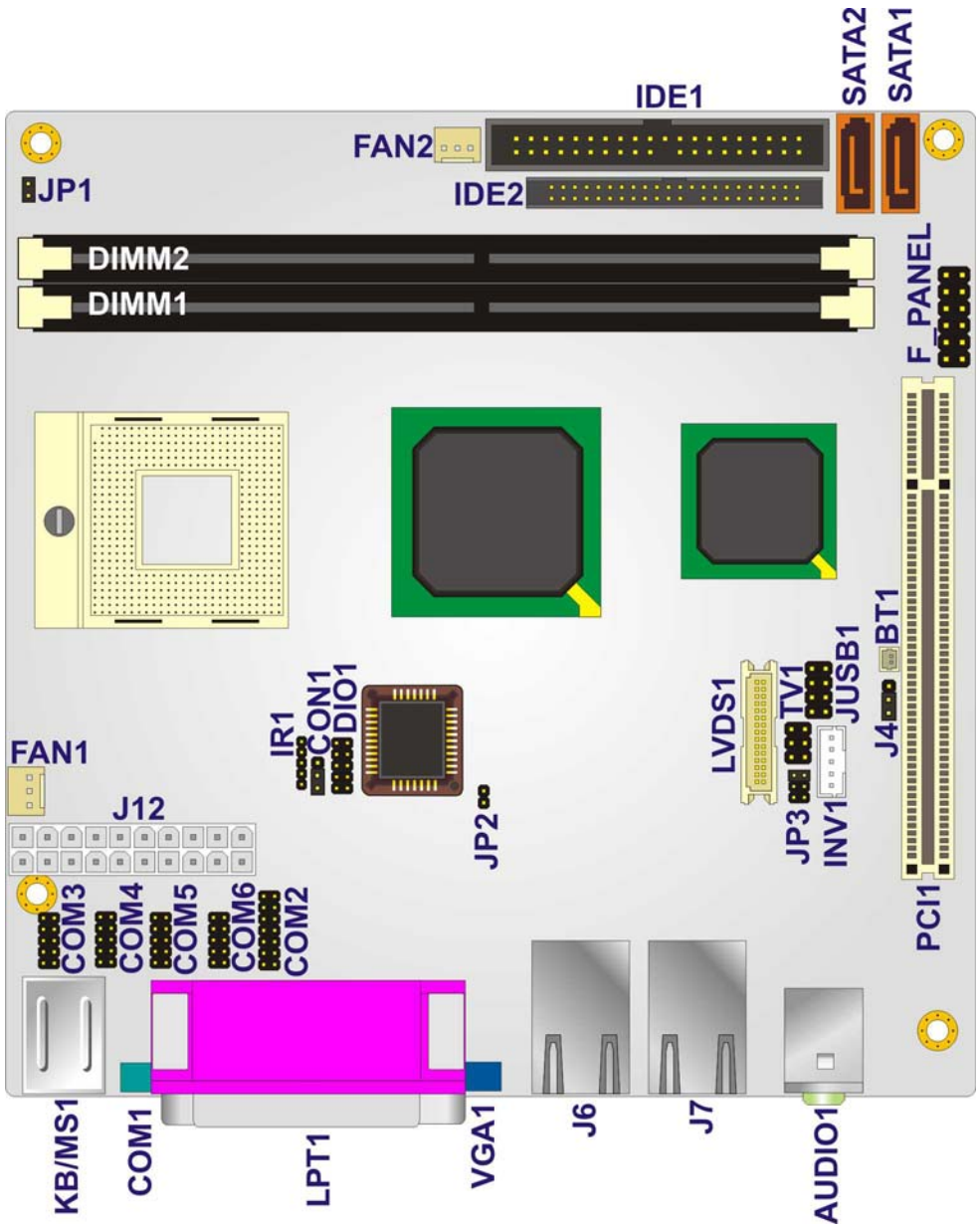


Figure 4-1: Connector and Jumper Locations

4.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the KINO-6612. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power connector (20-pin)	20-pin ATX connector	J12
Backlight inverter connector	5-pin wafer	INV1
CF Type II socket	50-pin socket	CF1
GPIO connector	10-pin header	DIO1
Fan connector, CPU	3-pin wafer	FAN1
Fan connector, system	3-pin wafer	FAN2
Front panel connector	14-pin header	F_PANEL1
Front panel connector	14-pin header	F_PANEL2
Hard disk drive (HDD) connector	40-pin box header	IDE1
Hard disk drive (HDD) connector	44-pin box header	IDE2
Infrared connector	5-pin header	IR1
LVDS connector	30-pin crimp	LVDS1
PCI slot	128-pin slot	PCI1
Serial ATA (SATA) connector	7-pin SATA connector	SATA1
Serial ATA (SATA) connector	7-pin SATA connector	SATA2
Serial port connector (RS-232/422/485)	14-pin header	COM2
Serial port connector (RS-232)	10-pin header	COM3
Serial port connector (RS-232)	10-pin header	COM4
Serial port connector (RS-232)	10-pin header	COM5
Serial port connector (RS-232)	10-pin header	COM6

TV out connector	6-pin header	TV1
USB connector	8-pin header	JUSB1

Table 4-1: Peripheral Interface Connectors

4.2.1 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the KINO-6612. Detailed descriptions of these connectors can be found in **Section 4.4** on **page 66**.

Connector	Type	Label
Audio connector	Dual audio jacks	AUDIO1
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
Keyboard/mouse	Dual PS/2	KB/MS1
Parallel port	Female DB-26	LPT1
RS-232 serial port connector	Male DB-9	COM1
USB port	USB port	USB1
USB port	USB port	USB2

USB port	USB port	USB3
USB port	USB port	USB4
VGA port connector	15-pin female	VGA

Table 4-2: Rear Panel Connectors

4.3 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the KINO-6612.

4.3.1 ATX Power Connector (20-pin)

CN Label: J12

CN Type: 20-pin ATX (2x10)

CN Location: See Figure 4-2

CN Pinouts: See Table 4-3

The ATX connector is connected to an external ATX power supply. Power is provided to the system, from the power supply through this connector.

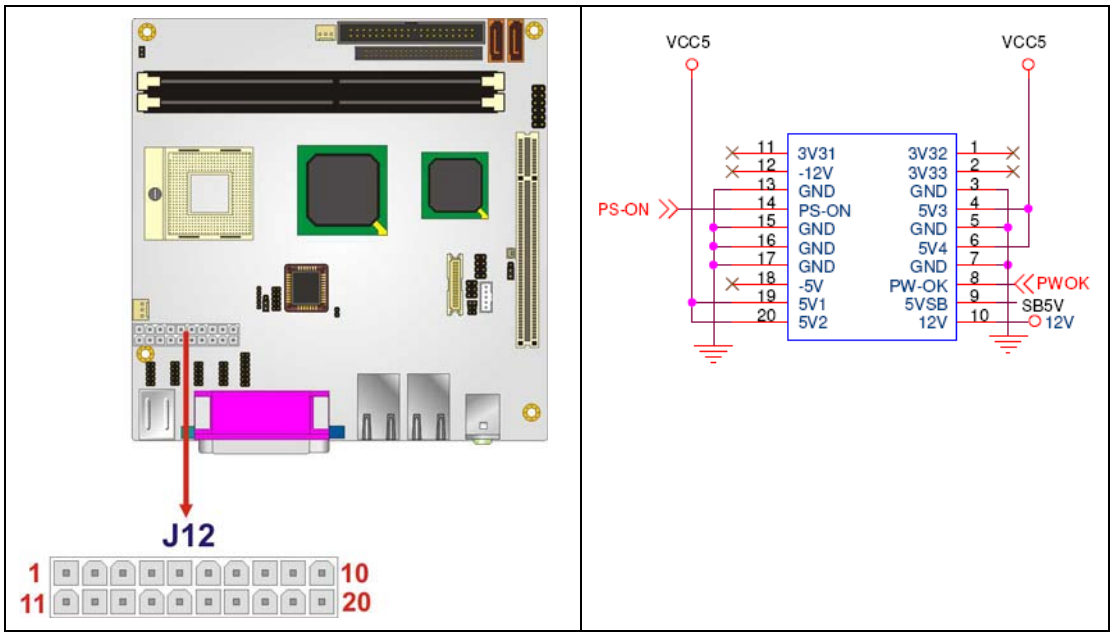


Figure 4-2: ATX Power Connector (20-pin) Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	11	NC
2	NC	12	N/C
3	GND	13	GND
4	VCC5	14	PSON-
5	GND	15	GND
6	VCC5	16	GND
7	GND	17	GND
8	PWOK	18	N/C
9	SB5V	19	VCC5
10	+12V	20	VCC5

Table 4-3: ATX Power Connector (20-pin) Pinouts

4.3.2 Backlight Inverter Connector

CN Label: INV1

CN Type: 5-pin wafer (1x5)

CN Location: See Figure 4-3

CN Pinouts: See Table 4-4

The backlight inverter connector provides the backlight on the LCD display connected to the KINO-6612 with +12V of power.

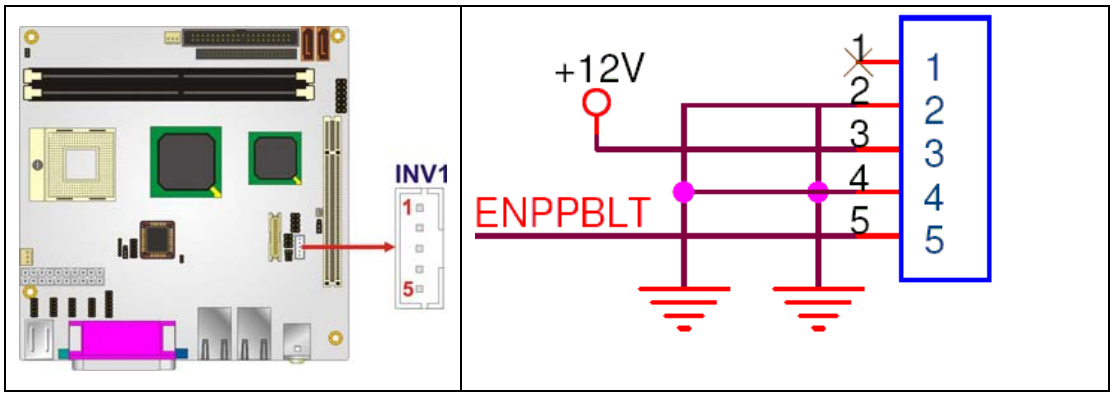


Figure 4-3: Panel Backlight Connector Pinout Locations

PIN NO.	DESCRIPTION
1	N/C
2	GROUND
3	+12V
4	GROUND
5	BACKLIGHT ENABLE

Table 4-4: Panel Backlight Connector Pinouts

4.3.3 Fan Connectors (+12V, 3-pin)

CN Label: FAN1, FAN2

CN Type: 3-pin header

CN Location: See Figure 4-4

CN Pinouts: See Table 4-5

The cooling fan connectors provide a 12V, 500mA current to two cooling fans. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

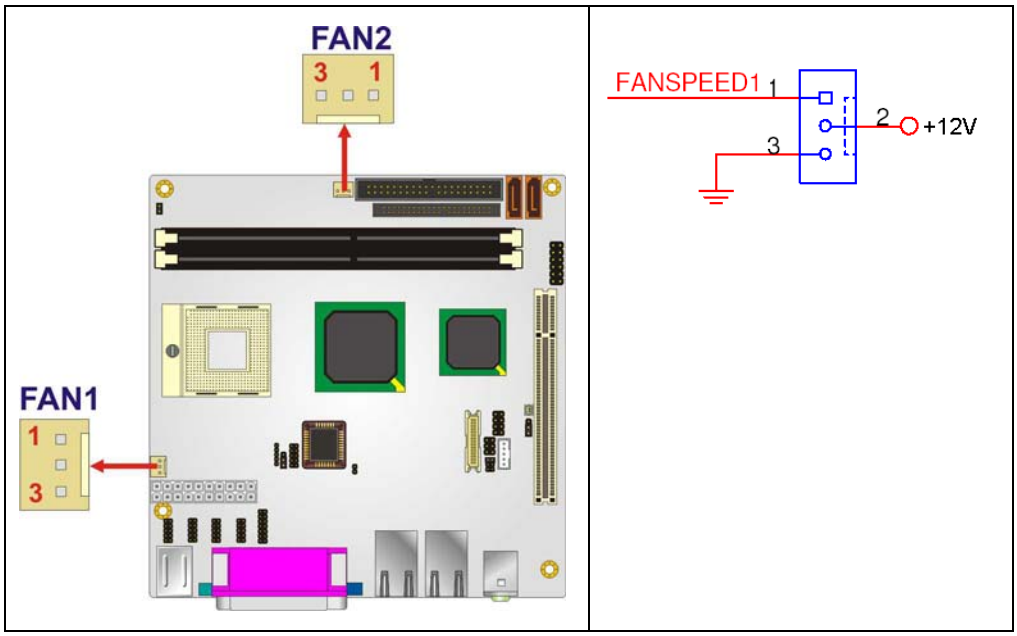


Figure 4-4: +12V Fan Connector Location

PIN NO.	DESCRIPTION
1	Fan Speed Detect
2	+12V
3	GND

Table 4-5: +12V Fan Connector Pinouts

4.3.4 Front Panel Connector (14-pin)

CN Label: F_PANEL1, F_PANEL2

CN Type: 14-pin header (2x7)

CN Location: See Figure 4-5

CN Pinouts: See Table 4-6

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button
- Reset button
- Power LED
- HDD LED

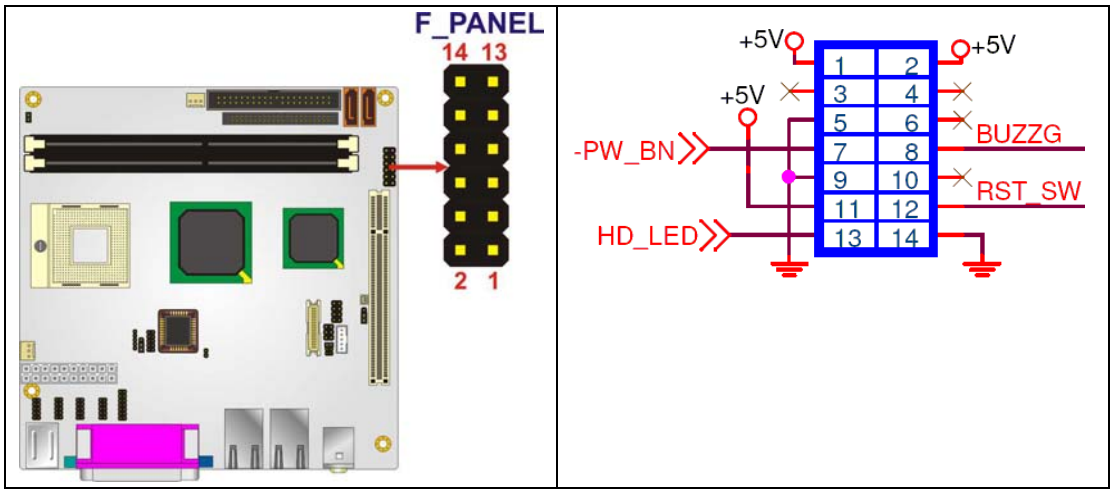


Figure 4-5: Front Panel Connector Pinout Locations

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	+5V	Speaker	2	+5V
	3	N/C		4	N/C
	5	Ground		6	N/C
Power	7	PWRBTN-		8	Speaker

Button	9	GND	Reset	10	N/C
HDD LED	11	+5V		12	Reset-
	13	HDD LED-		14	GND

Table 4-6: Front Panel Connector Pinouts

4.3.5 GPIO Connector

CN Label: CN14

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-6

CN Pinouts: See Table 4-7

The GPIO connector can be connected to external I/O control devices including sensors, lights, alarms and switches.

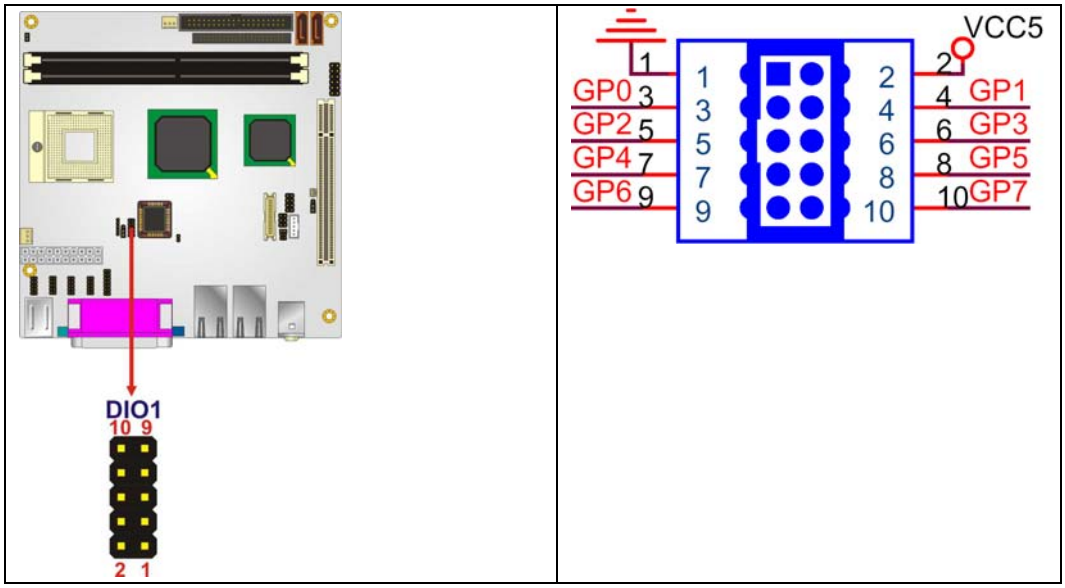


Figure 4-6: GPIO Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	5V
3	GPI0	4	GPI1

5	GPI2	6	GPI3
7	GPO0	8	GPO1
9	GPO2	10	GPO3

Table 4-7: GPIO Connector Pinouts

4.3.6 IDE Connector (40-pin)

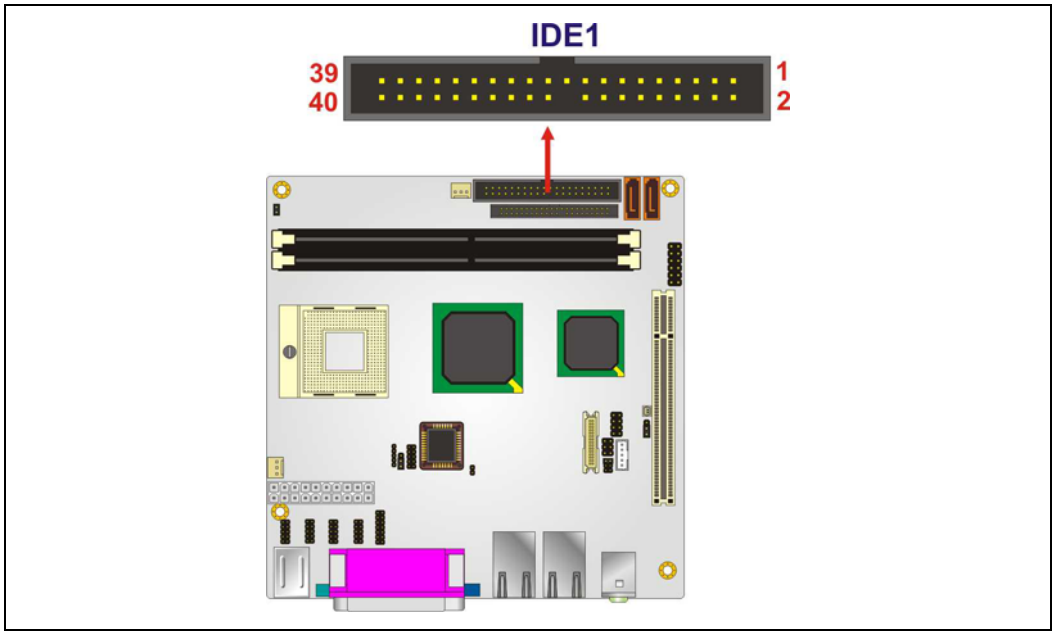
CN Label: IDE1

CN Type: 40-pin header (2x20)

CN Location: See Figure 4-7

CN Pinouts: See Table 4-8

One 40-pin IDE device connector on the KINO-6612 supports connectivity to two hard disk drives.



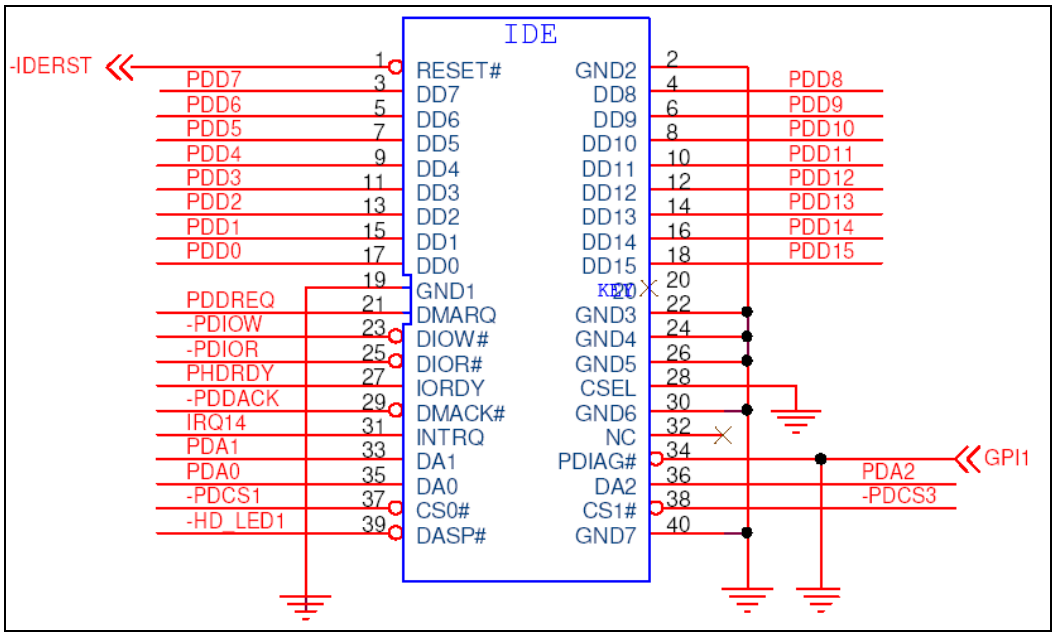


Figure 4-7: IDE Device Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND-DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C

35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

Table 4-8: IDE Connector Pinouts

4.3.7 IDE Connector(44-pin)

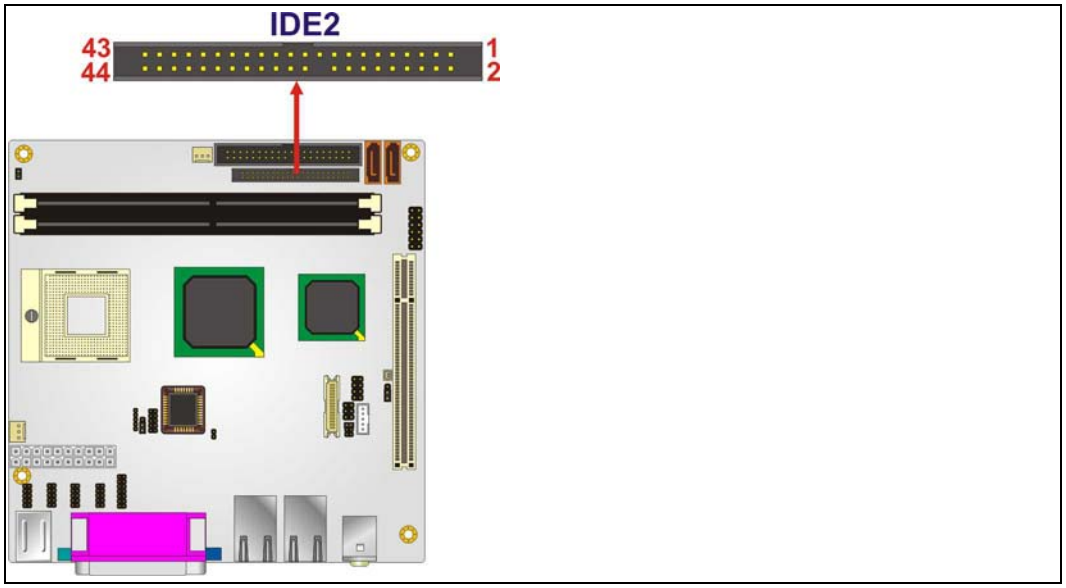
CN Label: IDE2

CN Type: 44-pin header (2x22)

CN Location: See Figure 4-8

CN Pinouts: See Table 4-9

One 44-pin IDE device connector on the KINO-6612 supports connectivity to two hard disk drives.



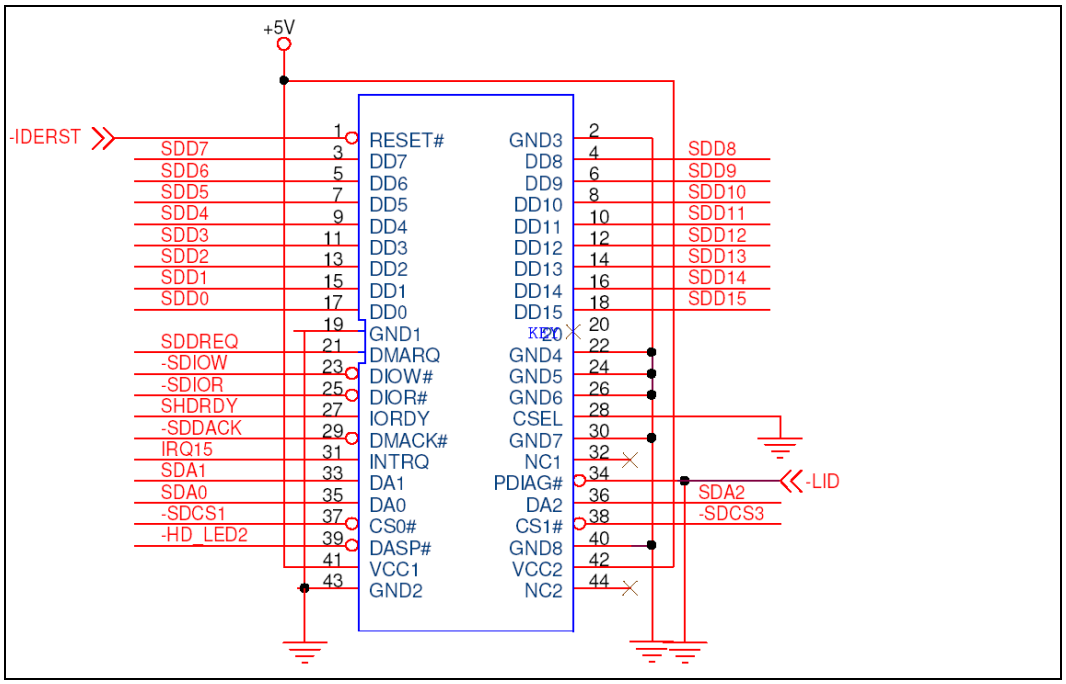


Figure 4-8: Secondary IDE Device Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C

33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

Table 4-9: Secondary IDE Connector Pinouts

4.3.8 Infrared Interface Connector (5-pin)

CN Label: IR1

CN Type: 5-pin header (1x5)

CN Location: See Figure 4-9

CN Pinouts: See Table 4-10

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

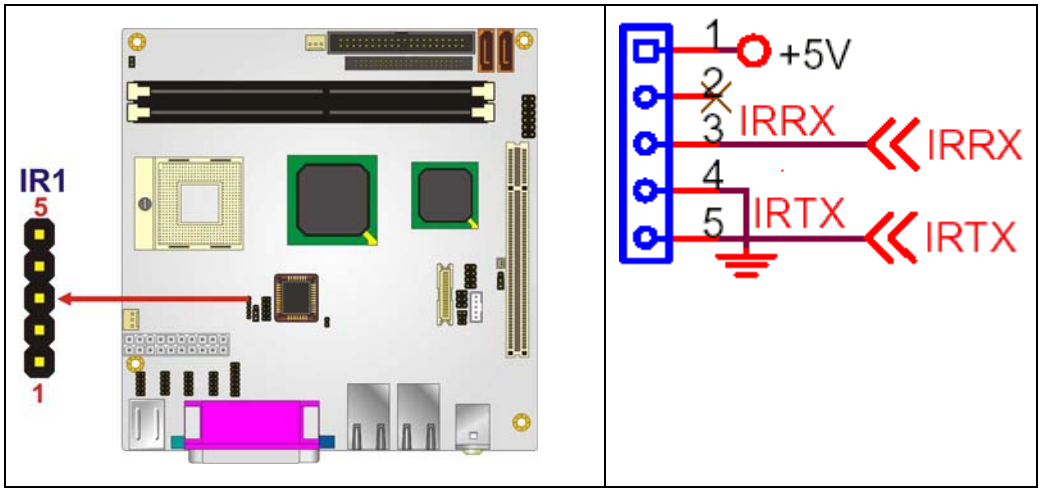


Figure 4-9: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC

2	NC
3	IR-RX
4	GND
5	IR-TX

Table 4-10: Infrared Connector Pinouts

4.3.9 LVDS LCD Connector

CN Label: LVDS1

CN Type: 30-pin crimp (2x10)

CN Location: See Figure 4-10

CN Pinouts: See Table 4-11

The 30-pin LVDS LCD connector can be connected to single channel or dual channel, 18-bit or 36-bit LVDS panel.

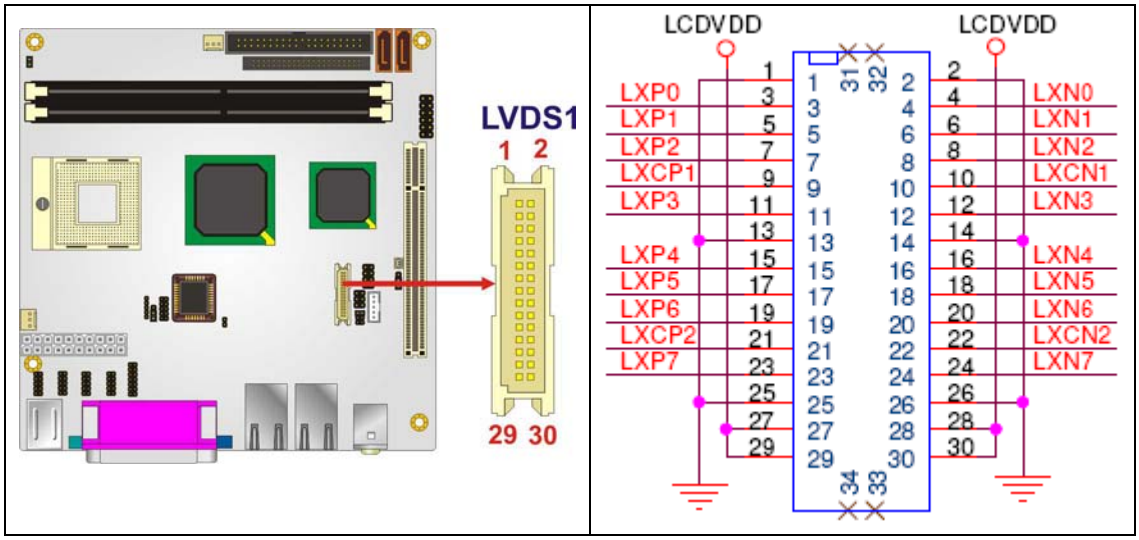


Figure 4-10: LVDS LCD Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	A0P	4	A0M

5	A1P	6	A1M
7	A2P	8	A2M
9	CLK1P	10	CLK1M
11	A3P	12	A3M
13	GND	14	GND
15	A4P	16	A4M
17	A5P	18	A5M
19	A6P	20	A6M
21	CLK2P	22	CLK2M
23	A7P	24	A7M
25	GND	26	GND
27	LCD_VDD	28	LCD_VDD
29	LCD_VDD	30	LCD_VDD

Table 4-11: LVDS LCD Port Connector Pinouts

4.3.10 PCI Slot

CN Label: PCI1

CN Type: PCI Slot

CN Location: See Figure 4-11

CN Pinouts: See Table 4-12

The PCI slot enables a PCI expansion module to be connected to the board.

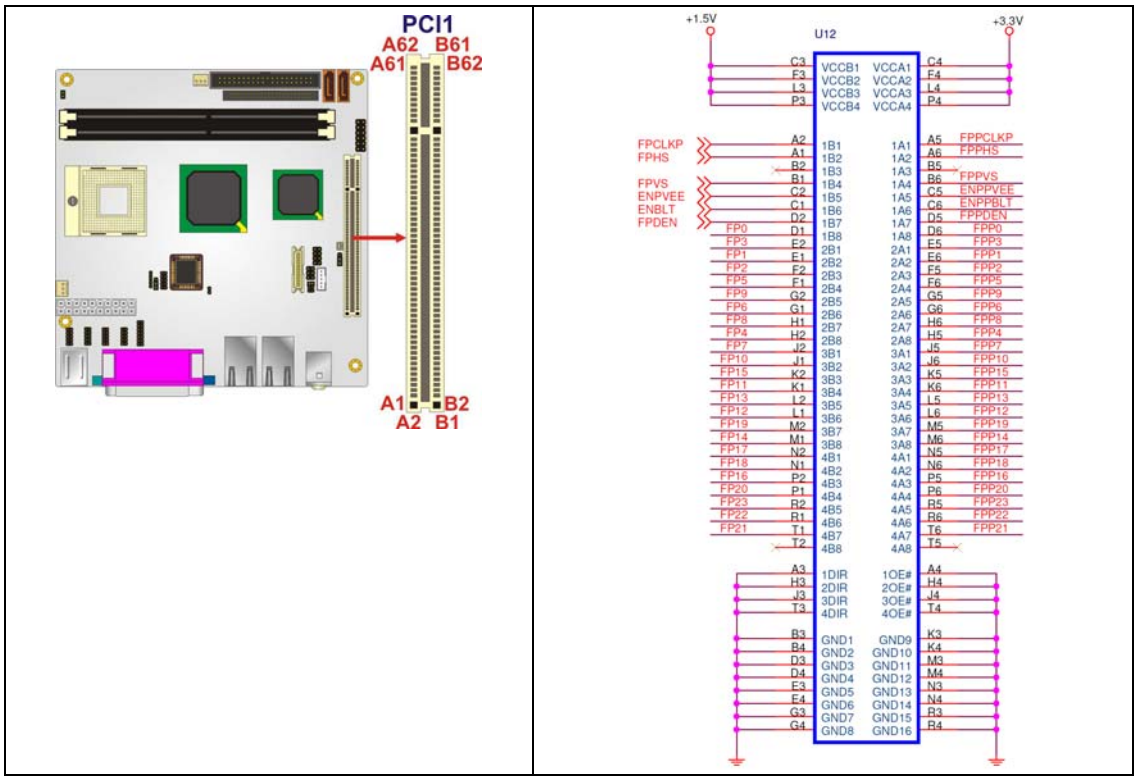


Figure 4-11: PCI Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	TRST	B1	-12V
A2	+12V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	+5V	B5	+5V
A6	INTA	B6	+5V
A7	INTC	B7	INTB
A8	+5V	B8	INTD
A9	RESERVED3	B9	PRSNT1
A10	+5V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND

A14	3.3V_AUX	B14	RESERVED2
A15	RST	B15	GND
A16	+5V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5V
A20	AD30	B20	AD31
A21	+3.3V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3V
A26	IDSEL	B26	C/BE3
A27	+3.3V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3V
A32	AD16	B32	AD17
A33	+3.3V	B33	C/BE2
A34	FRAME	B34	GND
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3V
A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3V
A42	GND	B42	SERR
A43	PAR	B43	+3.3V
A44	AD15	B44	C/BE1
A45	+3.3V	B45	AD14

A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3V	B53	AD7
A54	AD6	B54	+3.3V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5V	B59	+5V
A60	REQ64	B60	ACK64
A61	+5V	B61	+5V
A62	+5V	B62	+5V

Table 4-12: PCI Slot

4.3.11 SATA Drive Connectors

CN Label: SATA1, SATA2

CN Type: 7-pin SATA drive connectors

CN Location: See Figure 4-12

CN Pinouts: See Table 4-13

The four SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 150Mb/s. The SATA drives can be configured in a RAID configuration.

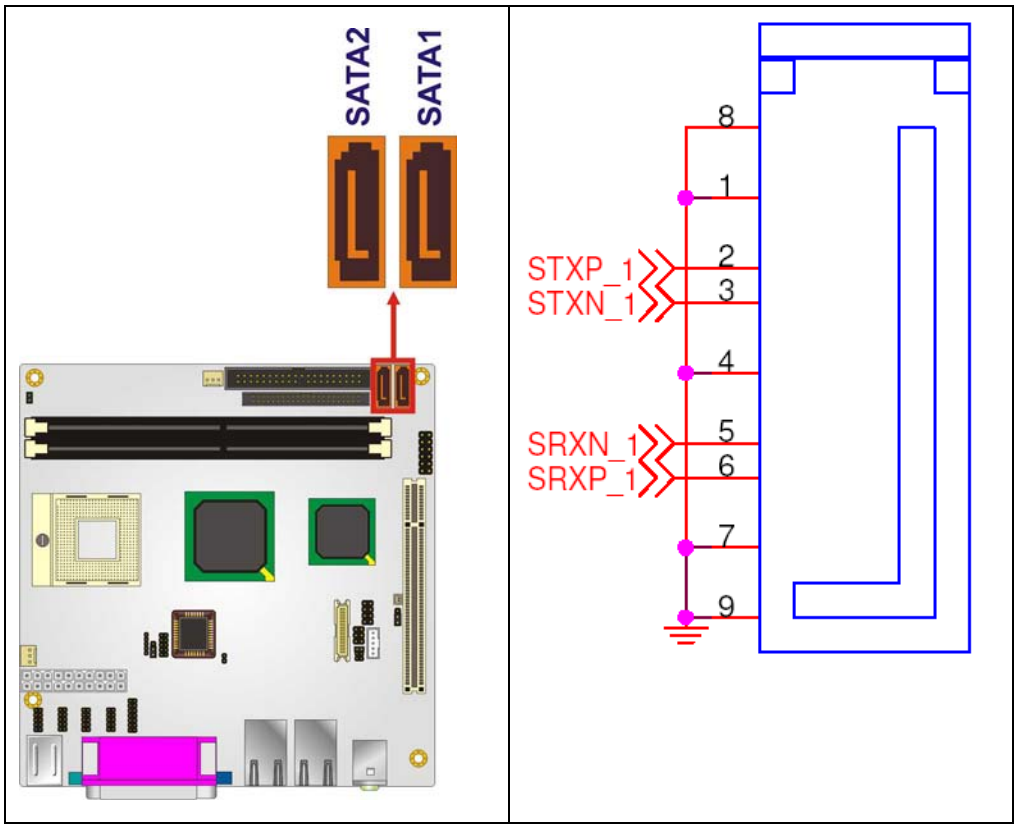


Figure 4-12: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 4-13: SATA Drive Connector Pinouts

4.3.12 Serial Port Connectors (COM 3, COM4, COM5 and COM6)

CN Label: COM 3, COM4, COM5 and COM6

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-13

CN Pinouts: See Table 4-14

The 10-pin serial port connector provides a second RS-232 serial communications channel. The COM serial port connectors can be connected to external RS-232 serial port devices.

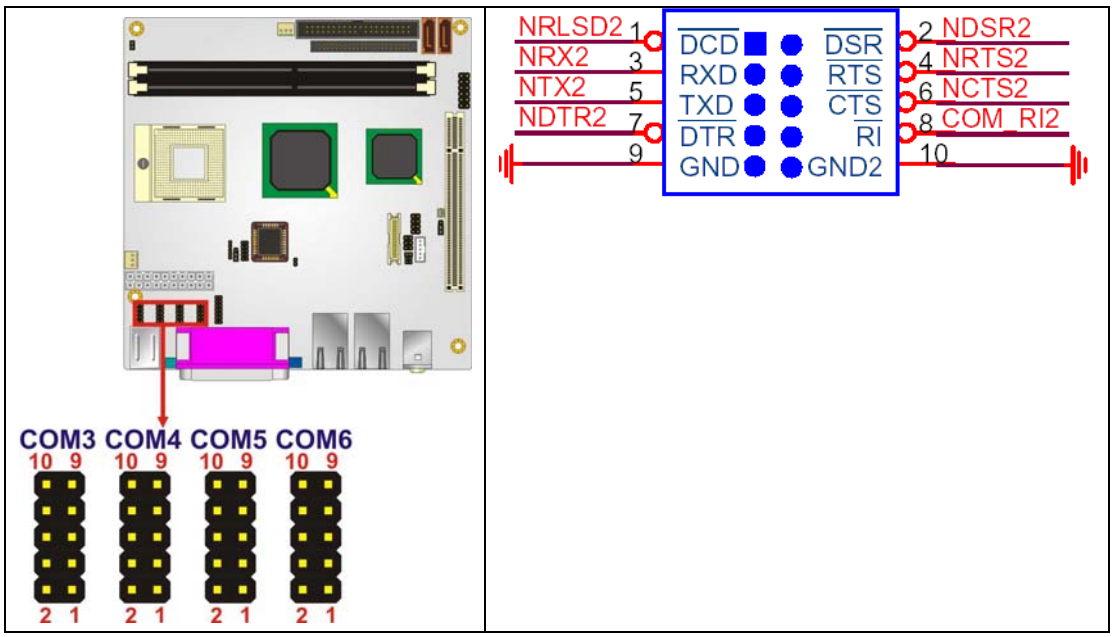


Figure 4-13: COM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	N/C

Table 4-14: COM Connector Pinouts

4.3.13 Serial Port Connector (COM 2)(RS-232, RS-422 or RS-485)

CN Label: COM2

CN Type: 14-pin header (2x7)

CN Location: See Figure 4-14

CN Pinouts: See Table 4-15

The 14-pin serial port connector connects to the COM2 serial communications channels. COM2 is a multi function channel. In default mode COM2 is an RS-232 serial communication channel but, with the COM2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.

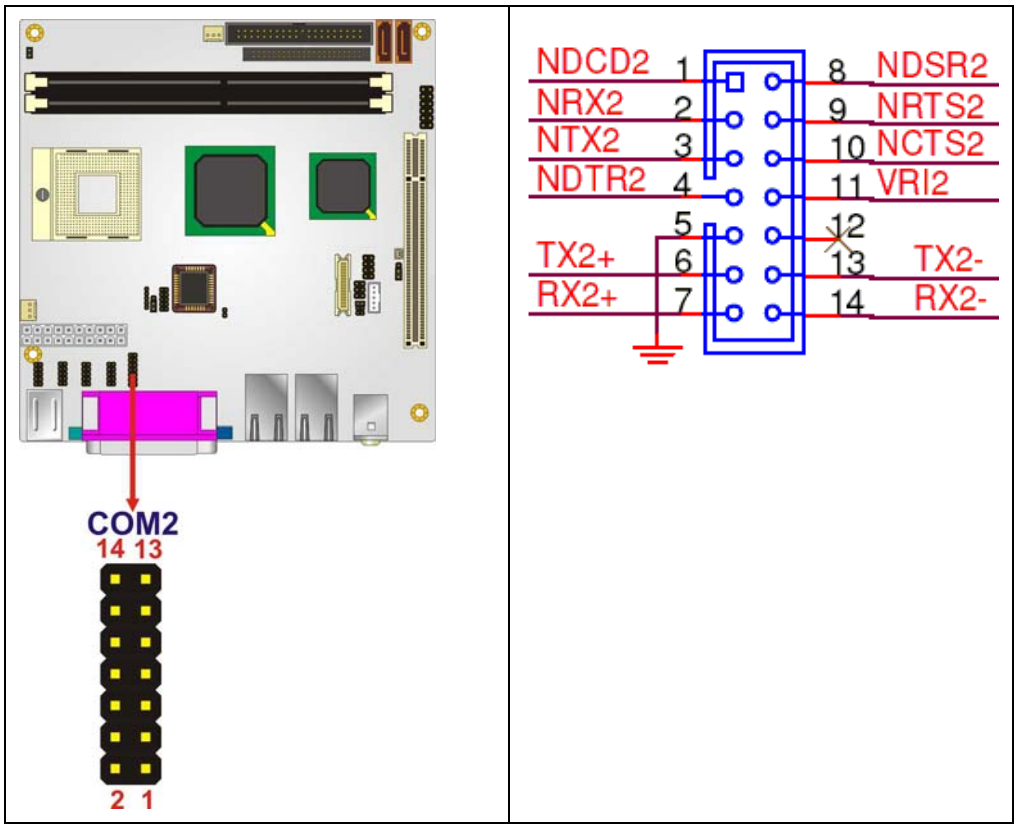


Figure 4-14: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD	8	NDSR
2	NRX	9	NRTS
3	NTX	10	NCTS2
4	NDTR	11	NRI
5	GND	12	GND
6	TX+	13	TX-
7	RX+	14	RX-

Table 4-15: RS-232/RS-485 Serial Port Connector Pinouts

4.3.14 TV Out Connector

CN Label: TV1

CN Type: 6-pin header (2x3)

CN Location: See Figure 4-15

CN Pinouts: See Table 4-16

The 2x3 pin TV out connector connects to a TV output by using an S-Video or RCA connector. The TV out connector makes displaying media data on a television easier.

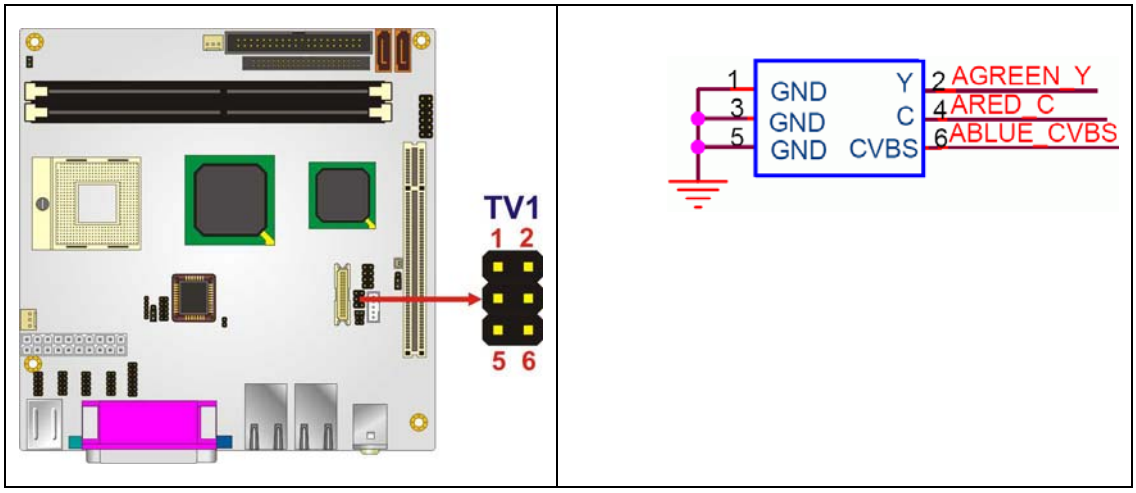


Figure 4-15: TV Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	IOY
3	GND	4	IOC
5	GND	6	IOCOMP

Table 4-16: TV Port Connector Pinouts

4.3.15 USB Connectors (Internal)

CN Label: JUSB1

CN Type: 8-pin header (2x4)

CN Location: See Figure 4-16

CN Pinouts: See Table 4-17

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices.. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

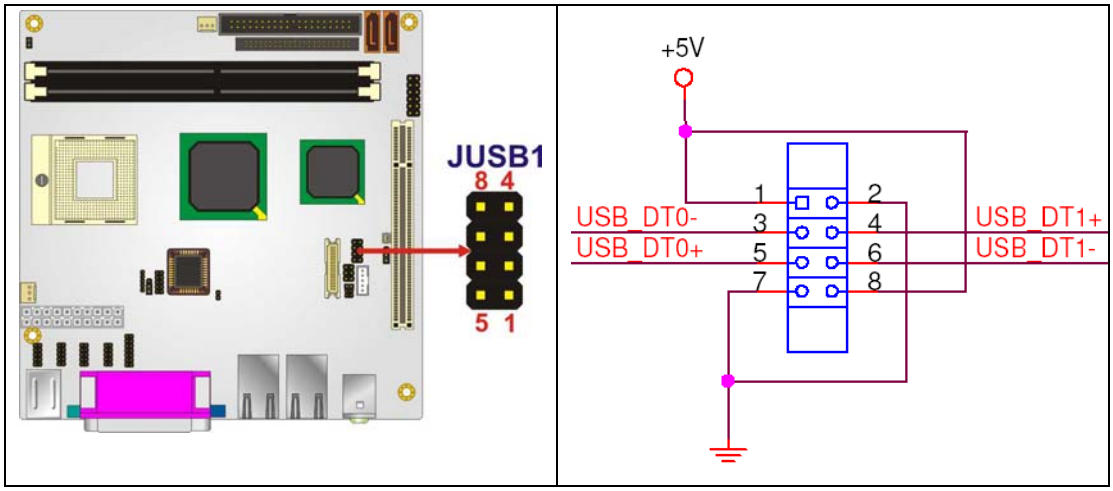


Figure 4-16: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATAN-	4	DATA1M-
5	DATAN+	6	DATAM+
7	GND	8	VCC

Table 4-17: USB Port Connector Pinouts

4.4 External Peripheral Interface Connector Panel

Figure 4-17 shows the KINO-6612 external peripheral interface connector (EPIC) panel. The KINO-6612 EPIC panel consists of the following:

- 2 x Audio jack connectors
- 2 x RJ-45 LAN connectors
- 2 x PS/2 connectors
- 1 x Serial port connectors
- 1 x Parallel port connector
- 4 x USB connectors
- 1 x VGA connector

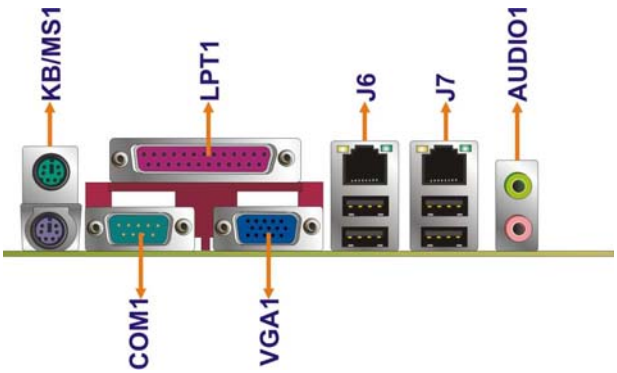


Figure 4-17: KINO-6612 External Peripheral Interface Connector

4.4.1 Audio Connector

CN Label: AUDIO1

CN Type: 2 x audio jacks

CN Location: See Figure 4-17

The three audio jacks on the external audio connector enable the KINO-6612 to be connected to external audio devices as specified below.

- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

Figure 4-18: Audio Connector

4.4.2 Keyboard/Mouse Connector

CN Label: KB/MS1

CN Type: Dual PS/2

CN Location: See Figure 4-17

CN Pinouts: See Figure 4-19 and Table 4-18

The KINO-6612 keyboard and mouse connectors are standard PS/2 connectors.

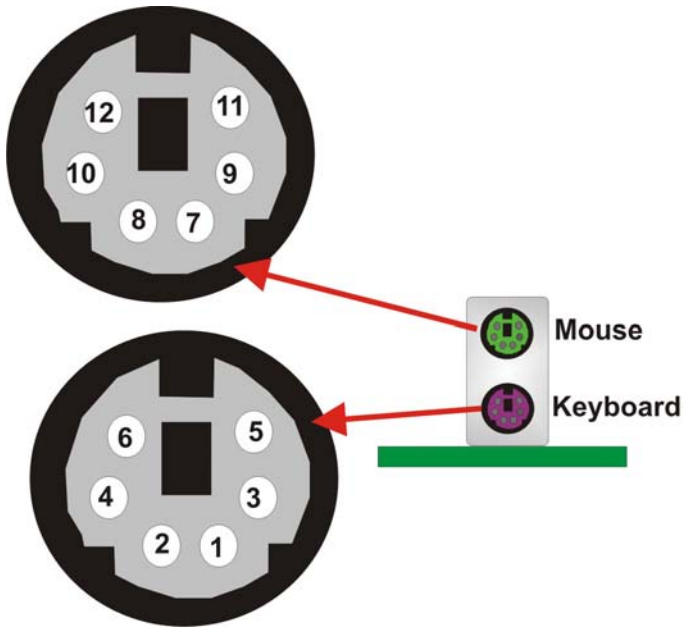


Figure 4-19: PS/2 Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	L_KDAT	7	L_MDAT
2	NC	8	NC
3	GND	9	GND
4	5V	10	5V
5	L_KCLK	11	L_MCLK
6	NC	12	NC

Table 4-18: PS/2 Connector Pinouts

4.4.3 LAN Connectors

CN Label: LAN1A and LAN2A

CN Type: RJ-45

CN Location: See Figure 4-17

CN Pinouts: See Table 4-19

The KINO-6612 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TXA+	5	TXC-
2	TXA-	6	TXB-
3	TXB+	7	TXD+
4	TXC+	8	TXD-

Table 4-19: LAN Pinouts

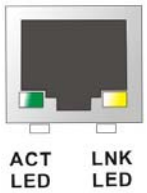


Figure 4-20: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 4-20**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 4-20: RJ-45 Ethernet Connector LEDs

4.4.4 Serial Port Connector (COM1)

CN Label: COM1

CN Type: DB-9 connectors

CN Location: See Figure 4-17 (see 2)

CN Pinouts: See Table 4-21 and Figure 4-21

The 9-pin DB-9 serial port connectors are connected to RS-232 serial communications devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 4-21: RS-232 Serial Port (COM 1) Pinouts

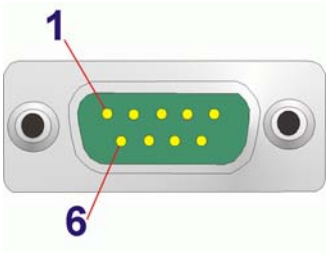


Figure 4-21: COM1 Pinout Locations

4.4.5 USB Connectors

CN Label: USB1, USB2, USB3, USB4

CN Type: USB port

CN Location: See Figure 4-17

CN Pinouts: See Table 4-22

The KINO-6612 has four external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBV3L 5V	2	GND
3	USBP4N	4	USBP5P
5	USBP4P	6	USBP5N
7	GND	8	USBV3L 5V

Table 4-22: USB Port Pinouts

4.4.6 VGA Connector

CN Label: VGA1

CN Type: 15-pin Female

CN Location: See Figure 4-17

CN Pinouts: See Figure 4-22 and Table 4-23

The KINO-6612 has a single 15-pin female connector for connectivity to standard display devices.

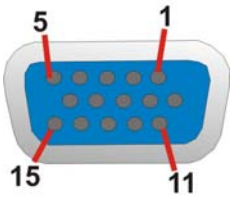


Figure 4-22: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 4-23: VGA Connector Pinouts

Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the KINO-6612 may result in permanent damage to the KINO-6612 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-6612. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-6612, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the KINO-6612, place it on an antic-static pad. This reduces the possibility of ESD damaging the KINO-6612.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the KINO-6612 is installed. All installation notices pertaining to the installation of the KINO-6612 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the KINO-6612 and injury to the person installing the motherboard.

5.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the KINO-6612, KINO-6612 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the KINO-6612 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the KINO-6612 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the KINO-6612 off:

- When working with the KINO-6612, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the KINO-6612 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the KINO-6612 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The KINO-6612 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - Primary and secondary IDE device
  - SATA drives
  - Power supply
  - USB cable
  - Serial port cable
- The following external peripheral devices are properly connected to the chassis:
  - I/O shield
  - VGA screen
  - Keyboard
  - Mouse

- RS-232 serial communications device
- USB devices

5.3 Unpacking

When the KINO-6612 is unpacked, please check all the unpacking list items listed in Chapter 3 are indeed present. If any of the unpacking list items are not available please contact the KINO-6612 vendor reseller/vendor where the KINO-6612 was purchased or contact an IEI sales representative.

5.4 CPU, CPU Cooling Kit and DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, KINO-6612 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the KINO-6612. If one of these component is not installed the KINO-6612 cannot run.

5.4.1 Socket 479 CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket 479 CPU onto the KINO-6612, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Unlock the CPU retention screw.** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 5-1**.

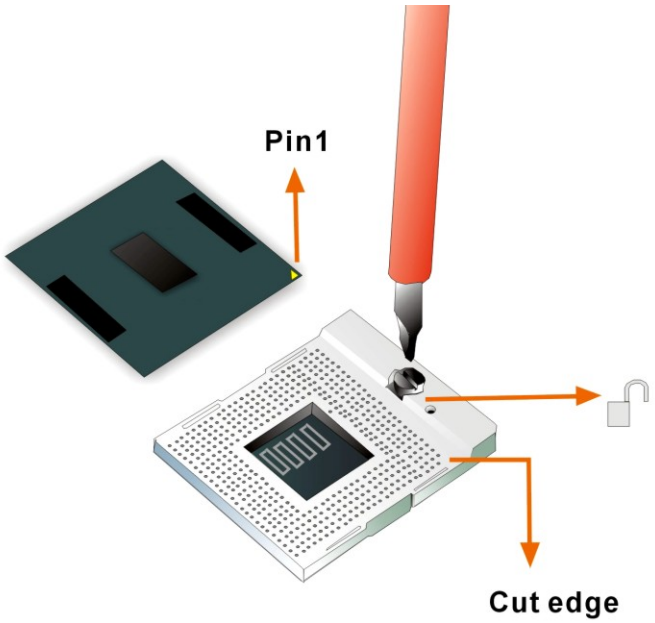


Figure 5-1: Make sure the CPU socket retention screw is unlocked

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: **Correctly Orientate the CPU**. Make sure the IHS (integrated heat sink) side is facing upwards.

Step 4: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the

CPU socket. See **Figure 5-1**.

Step 5: **Align the CPU pins.** Carefully align the CPU pins with the holes in the CPU socket.

Step 6: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.

Step 7: **Lock the retention screw.** Rotate the retention screw into the locked position. See **Figure 5-2**.

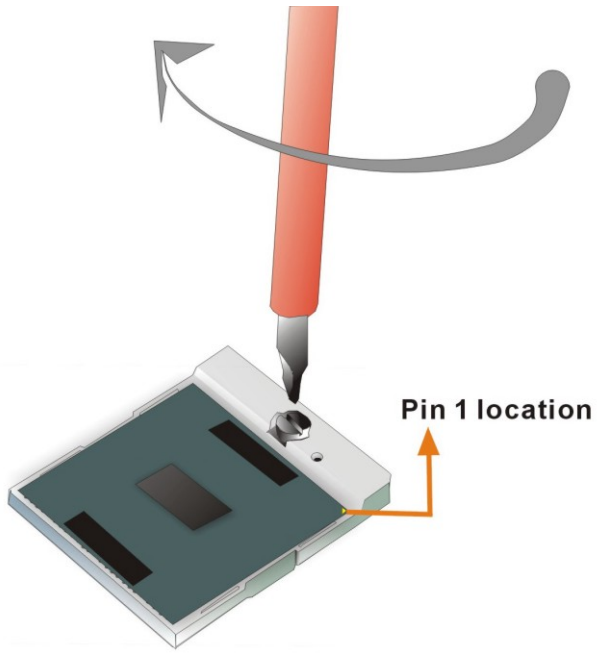


Figure 5-2: Lock the CPU Socket Retention Screw

5.4.2 Cooling Kit CF-479B-RS Installation

Figure 5-3: IEI CF-479B-RS Cooling Kit

An IEI Socket 479 CPU cooling kit (**Figure 5-3**) can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the [Fan model#] heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the CF-479B-RS cooling kit, please follow the steps below.

Step 1: **Place the cooling kit onto the CPU**. Make sure the CPU cooling fan cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit**. Make sure its four spring screw fasteners can pass through the pre-drilled holes on the PCB.

Step 3: **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 5-4**)

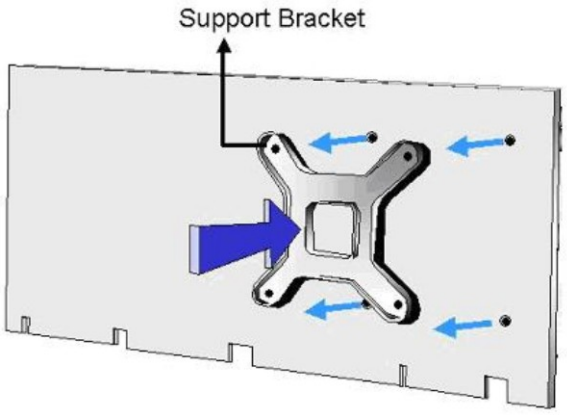


Figure 5-4: Cooling Kit Support Bracket

Step 4: **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 5: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the motherboard. Carefully route the cable and avoid heat generating chips and fan blades. See **Figure 5-5**.

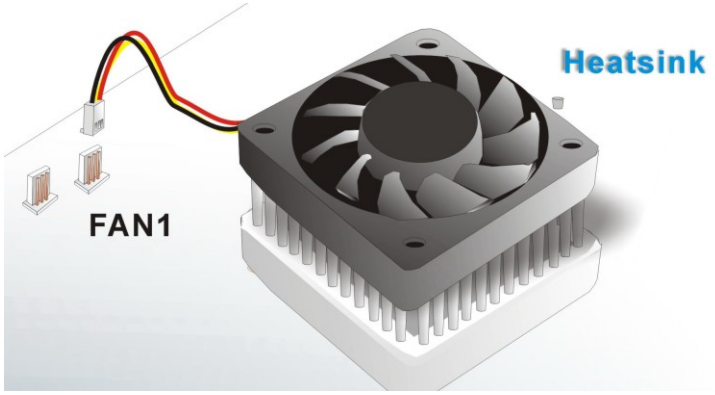


Figure 5-5: Connect the cooling fan cable

5.4.3 DIMM Installation

WARNING:

Using incorrectly specified DIMM may cause permanently damage the KINO-6612. Please make sure the purchased DIMM complies with the memory specifications of the KINO-6612. DIMM specifications compliant with the KINO-6612 are listed in **Chapter 2**.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-6**.

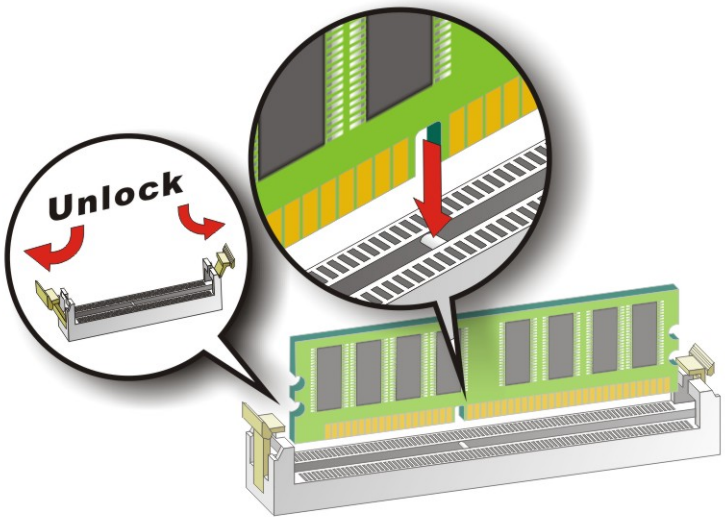


Figure 5-6: Installing a DIMM

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-6**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge

in the socket. See **Figure 5-6**.

Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-6**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

5.5 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

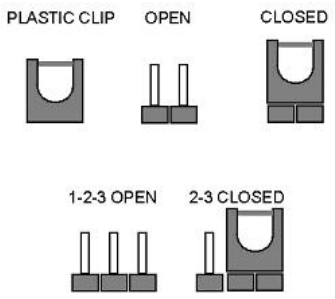


Figure 5-7: Jumper Locations

Before the KINO-6612 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the KINO-6612 are listed in **Table 5-1**.

Description	Label	Type
Clear CMOS	J4	3-pin header
CPU Frequency Select	JP2	2-pin header
FSB Select	JP1	2-pin header
LCD Voltage Select	JP3	6-pin header
RS-232/485 Serial Port Select	CON1	3-pin header

Table 5-1: Jumpers

5.5.1 Clear CMOS Jumper

Jumper Label: J4

Jumper Type: 3-pin header

Jumper Settings: See Table 5-2

Jumper Location: See Figure 5-8

If the KINO-6612 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-2**.

AT Power Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 5-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-8** below.

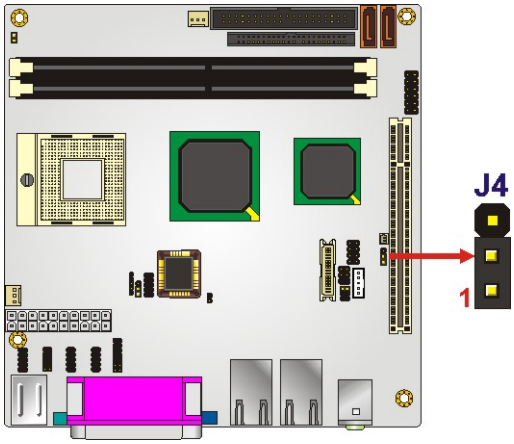


Figure 5-8: Clear CMOS Jumper

5.5.2 CPU Frequency Setup Jumper

Jumper Label: JP2

Jumper Type: 3-pin header

Jumper Settings: See Table 5-3

Jumper Location: See **Figure 5-9**

The CPU Frequency setup jumper enables a user to select the frequency of the CPU on the KINO-6612. The FSB CPU Frequency jumper settings are shown in **Table 5-2**.

FSB Setup	Description	
Short 1 – 2	100 MHz	Default
Short 2 – 3	133 MHz	

Table 5-3: CPU Frequency Setup Jumper Settings

The location of the CPU Frequency Setup jumper is shown in **Figure 5-8** below.

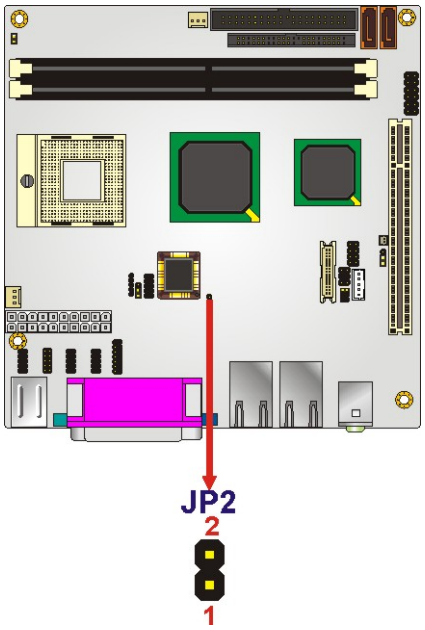


Figure 5-9: CPU Frequency Setup Jumper

5.5.3 FSB Setup Jumper

Jumper Label: JP1

Jumper Type: 3-pin header

Jumper Settings: See Table 5-4

Jumper Location: See Figure 5-10

The clear FSB setup jumper enables a user to select the FSB speed on the KINO-6612. The FSB Setup jumper settings are shown in **Table 5-2**.

FSB Setup	Description	
Short 1 – 2	Default	Default
Short 2 – 3	For 533MHz FSB CPU	

Table 5-4: FSB Setup Jumper Settings

The location of the FSB Setup jumper is shown in **Figure 5-8** below.

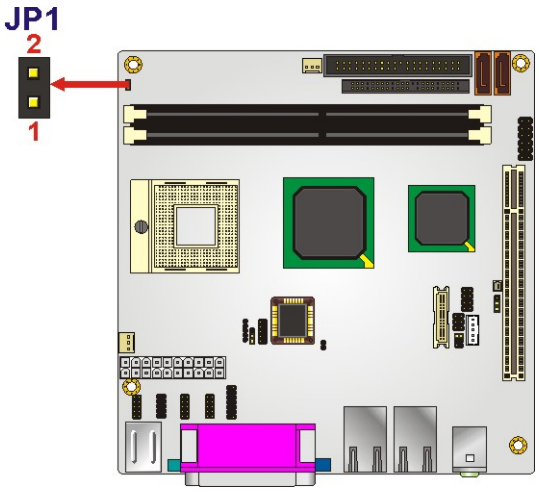


Figure 5-10: FSB Setup Jumper

5.5.4 LCD Voltage Selection

WARNING:

Permanent damage to the screen and KINO-6612 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

Jumper Label:	JP3
Jumper Type:	6-pin header
Jumper Settings:	See Table 5-5
Jumper Location:	See Figure 5-11

The **LCD Voltage Selection** jumper allows the LCD screen voltage to be set. The **LCD Voltage Selection** jumper settings are shown in **Table 5-5**.

AT Power Select	Description	
Short 1-2	+3V	Default
Short 2-3	+5V	
Short 2-3	+12V	

Table 5-5: LCD Voltage Selection Jumper Settings

The LCD Voltage Selection jumper location. is shown in **Figure 5-11**.

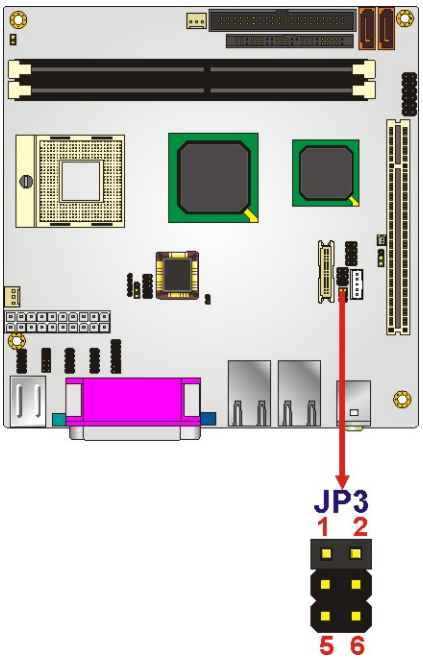


Figure 5-11: LCD Voltage Selection Jumper Location

5.5.5 RS-232/485 Serial Port Select Jumper

Jumper Label: CON1

Jumper Type: 3-pin header

Jumper Settings: See Table 5-6

Jumper Location: See Figure 5-12

The RS-232 or RS-422/RS-485 Serial Port Select jumper sets the communication protocol used by the second serial communications port (COM2) as RS-232 or RS-422/RS-485. The RS-232 or RS-422/RS-485 Serial Port Select settings are shown in **Table 5-6**.

RS-232/485 Select	Description	
Short 1-2	RS-232	Default
Short 2-3	RS-422/485	

Table 5-6: RS-232/485 Serial Port Select Jumper Settings

The RS-232/485 Serial Port Select jumper location is shown in **Figure 5-12**.

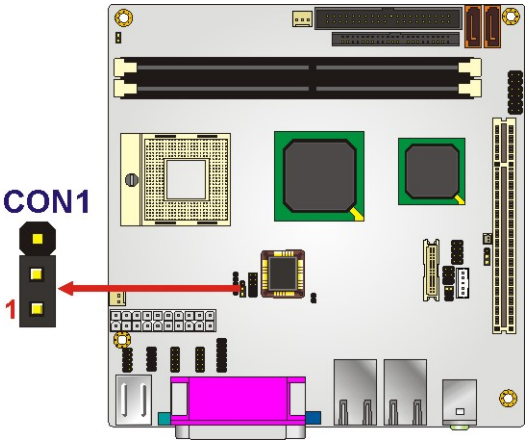


Figure 5-12: RS-232/485 Serial Port Select Jumper Location

5.6 Chassis Installation

5.6.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the KINO-6612 must have air vents to allow cool air to move into the system and hot air to move out.

The KINO-6612 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

NOTE:

IEI has a wide range of backplanes available. Please contact your KINO-6612 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

5.6.2 Motherboard Installation

To install the KINO-6612 motherboard into the chassis please refer to the reference material that came with the chassis.

5.7 Internal Peripheral Device Connections

5.7.1 Peripheral Device Cables

The cables listed in **Table 5-7** are shipped with the KINO-6612.

Quantity	Type
1	ATA 66/100 flat cable
1	I/O Shield
2	SATA drive cable
1	SATA drive power cable
1	Dual RS-232 cable

Table 5-7: IEI Provided Cables

Some optional items that can be purchased separately and installed on the KINO-6612 include:

- TV-OUT cable
- Dual RS-232 cable
- Dual USB cable

5.7.2 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to the KINO-6612 to one or two IDE devices. To connect an IDE HDD to the KINO-6612 please follow the instructions below.

Step 1: **Locate the IDE connector**. The location/s of the IDE device connector/s is/are shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See Figure 5-13. A key on the front of the cable connector ensures it can only be inserted in one direction.

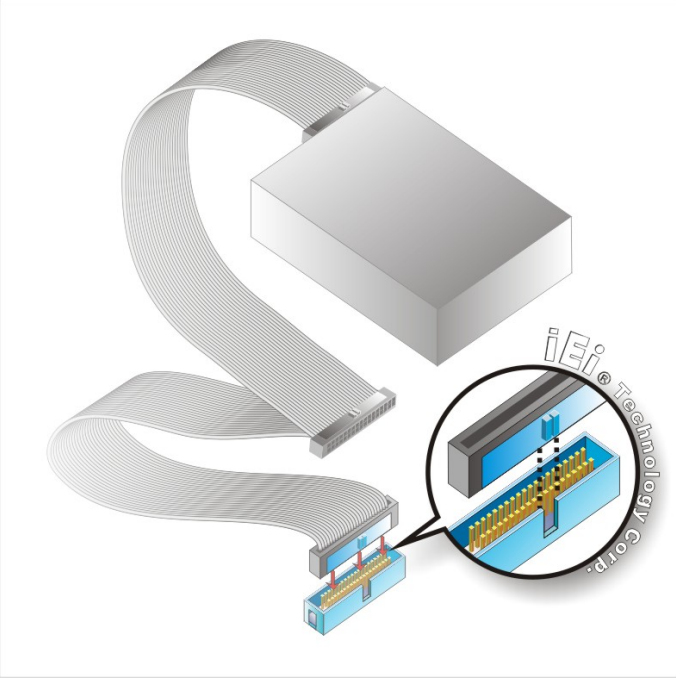


Figure 5-13: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector.

5.7.3 SATA Drive Connection

The KINO-6612 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-14**.

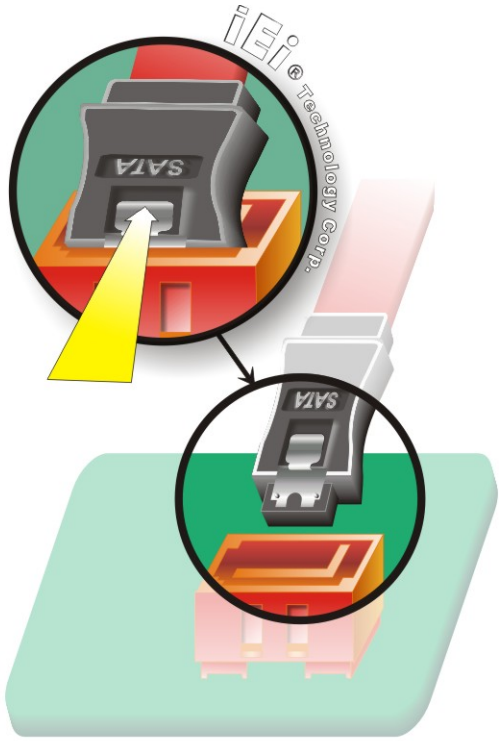


Figure 5-14: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end

of the cable to the connector at the back of the SATA drive. See **Figure 5-15**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-15**.

Figure 5-15: SATA Power Drive Connection

5.7.4 Dual RS-232 Cable with Slot Bracket

The dual RS-232 cable slot connector consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a slot. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 5-16**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

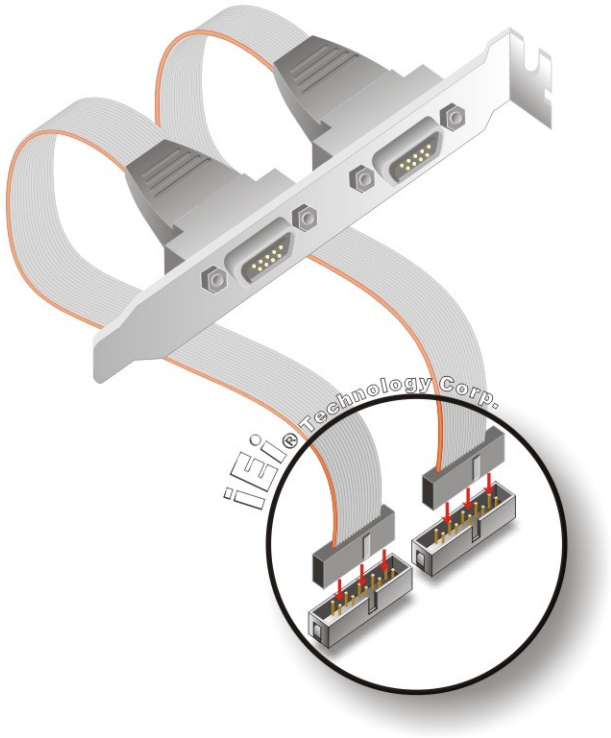


Figure 5-16: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis

5.7.5 USB Cable (Dual Port) with Slot Bracket

The KINO-6612 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 3**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the KINO-6612 USB connector.

Step 3: **Insert the cable connectors** Once the cable connectors are properly aligned with the USB connectors on the KINO-6612, connect the cable connectors to the onboard connectors. See **Figure 5-17**.

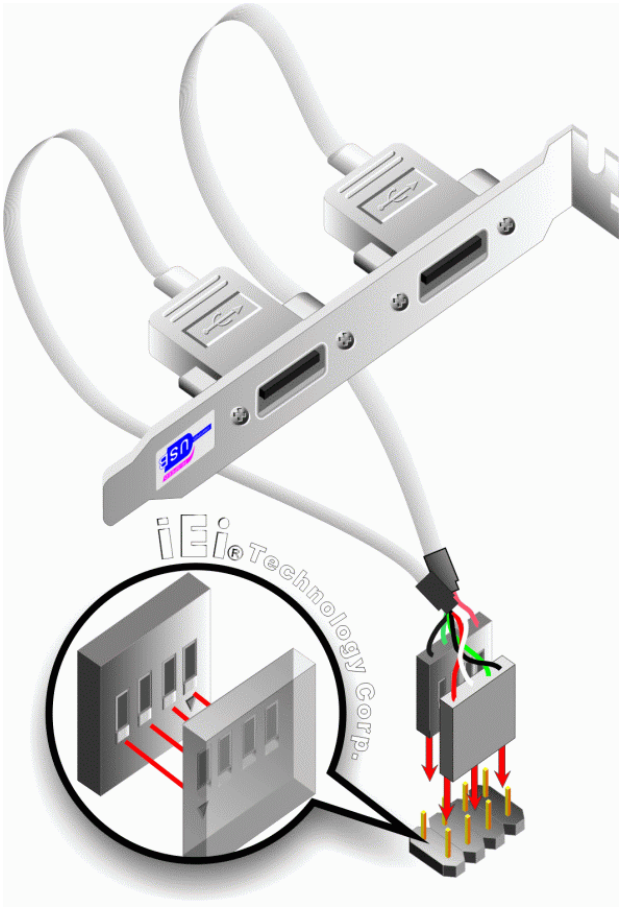


Figure 5-17: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Audio devices
- RJ-45 Ethernet cable connectors
- PS/2 devices
- Serial port devices
- USB devices
- VGA monitors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding KINO-6612 external peripheral interface connector making sure the pins are properly aligned.

5.8.1 Audio Connection

Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out. Follow the steps below to connect audio devices to the KINO-6612.

Step 1: **Locate the audio phone jacks**. The location of the audio phone jacks are shown in **Chapter 3**.

Step 2: **Insert audio phone jack plugs**. Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See Figure 5-18.

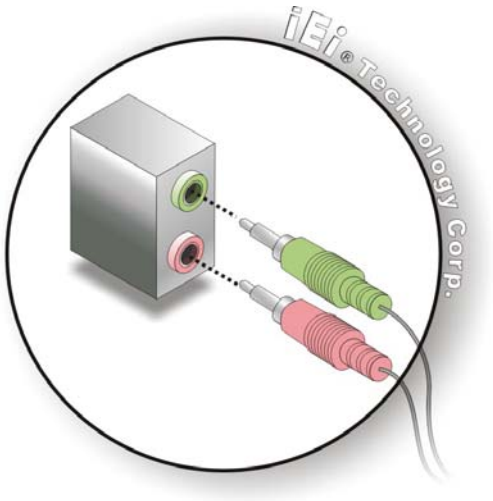


Figure 5-18: Audio Connectors

5.8.2 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the KINO-6612. See **Figure 5-19**.

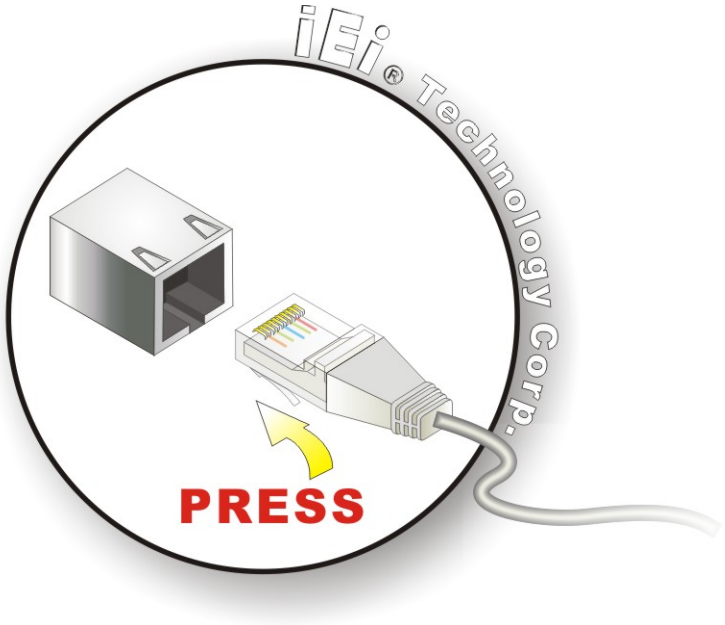


Figure 5-19: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

5.8.3 Parallel Device Connection

The KINO-6612 has a single female DB-25 connector on the external peripheral interface panel for parallel devices. Follow the steps below to connect a parallel device to the KINO-6612.

Step 1: **Locate the DB-25 connector**. The location of the DB-25 connector is shown in **Chapter 3**.

Step 2: **Insert the DB-25 connector**. Insert the DB-25 connector of a parallel device into the DB-25 connector on the external peripheral interface. See Figure 5-20.

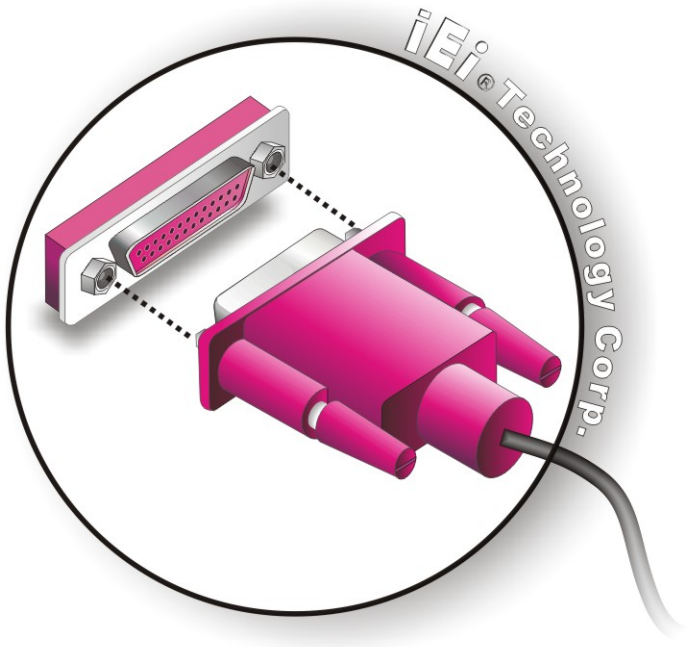


Figure 5-20: Parallel Device Connector

Step 3: **Secure the connector**. Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

5.8.4 PS/2 Keyboard and Mouse Connection

The KINO-6612 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the KINO-6612.

Step 1: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See Figure 5-21.

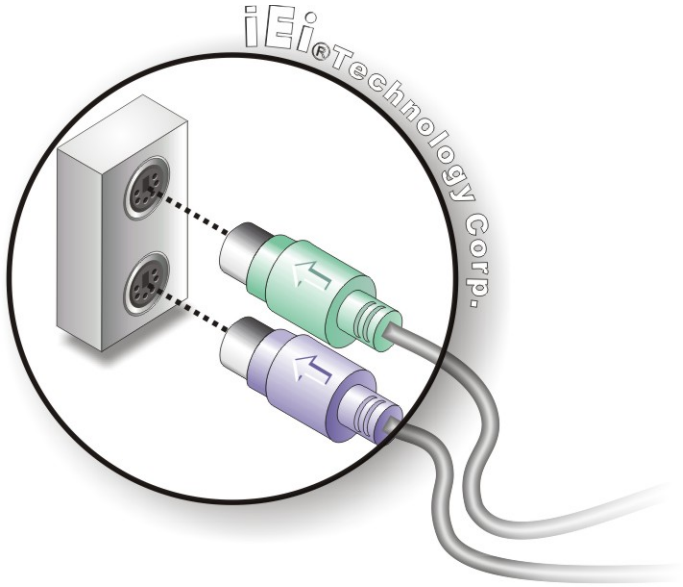


Figure 5-21: PS/2 Keyboard/Mouse Connector

5.8.5 Serial Device Connection

The KINO-6612 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the KINO-6612.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 5-22.

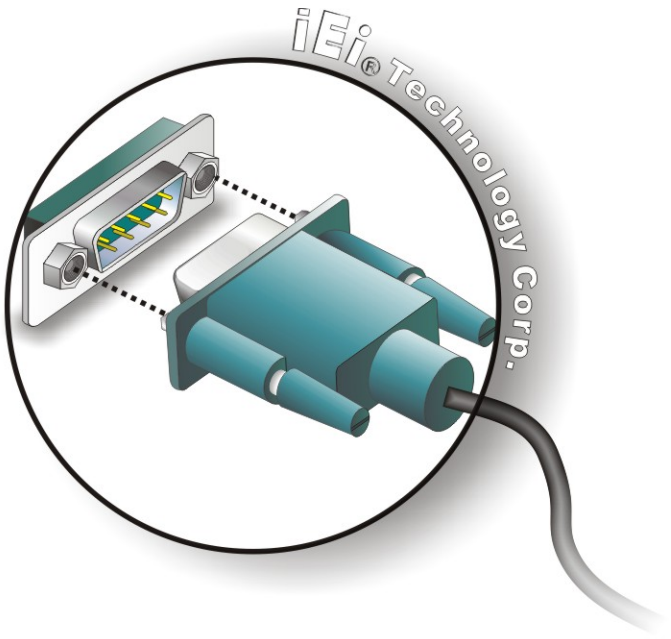


Figure 5-22: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

5.8.6 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the KINO-6612.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure 5-23**.

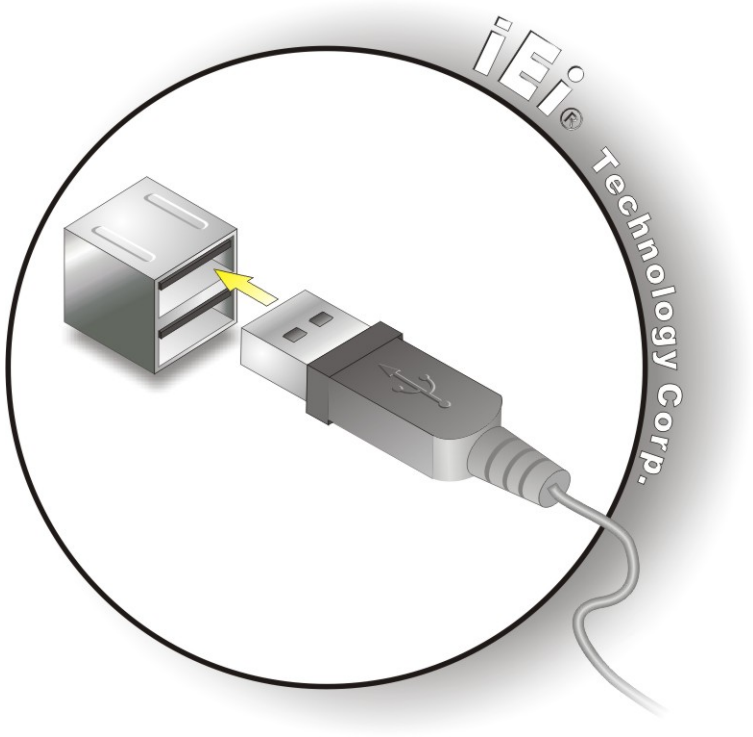


Figure 5-23: USB Connector

5.8.7 VGA Monitor Connection

The KINO-6612 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the KINO-6612, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the KINO-6612. See **Figure 5-24**.

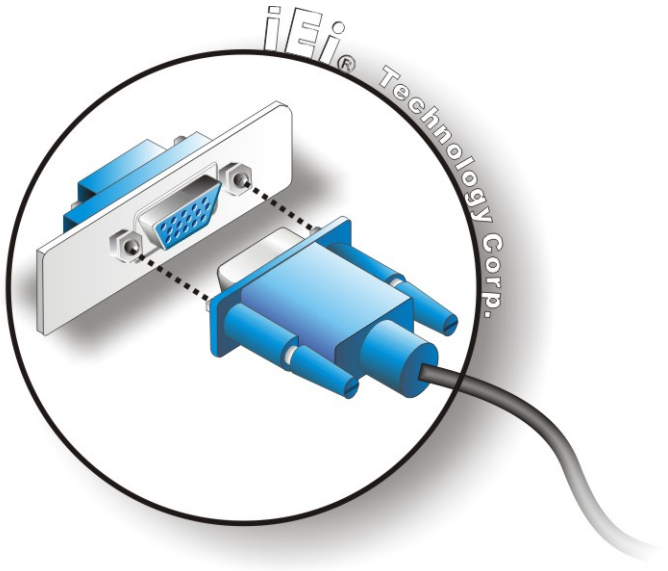


Figure 5-24: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

Chapter

6

BIOS Screens

6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen. 0.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

6.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 5**.

6.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

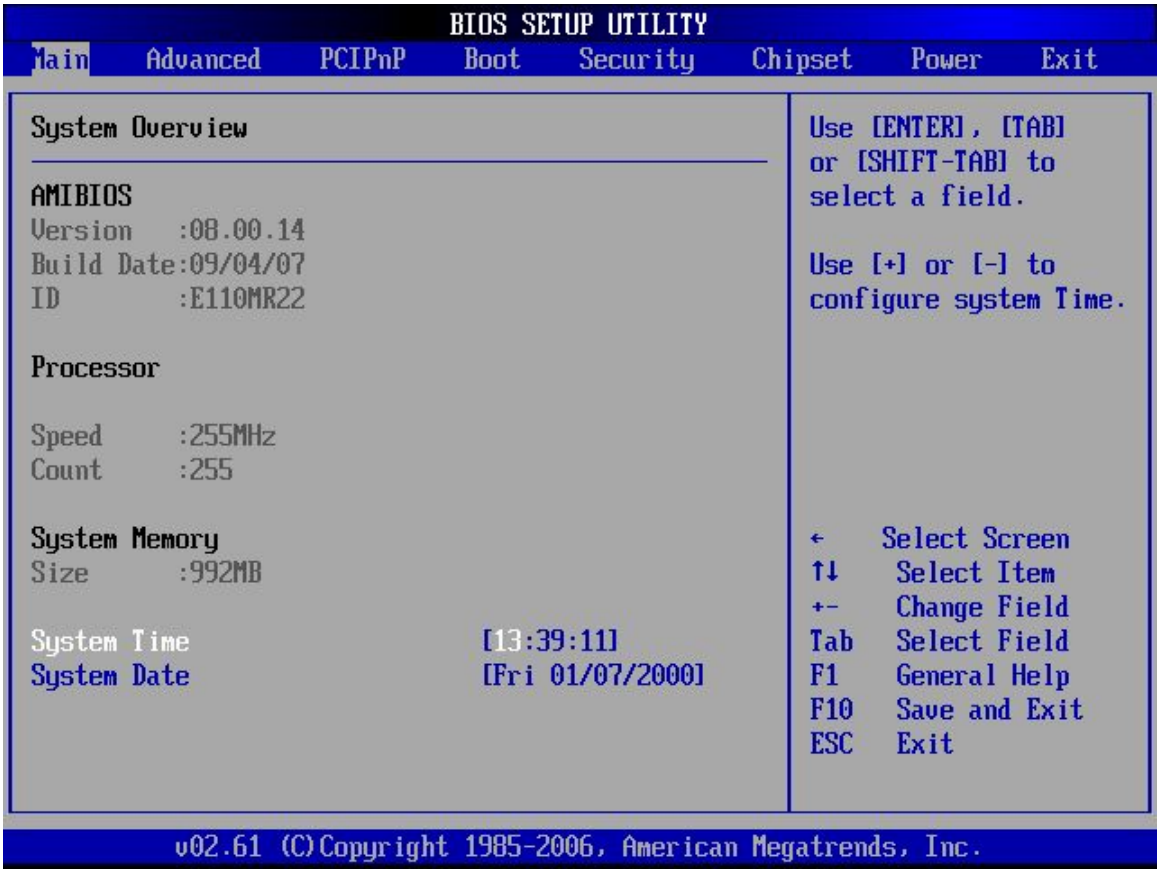
- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

6.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - Version: Current BIOS version
  - Build Date: Date the current BIOS version was made
  - ID: Installed BIOS ID

- **Processor**: Displays auto-detected CPU specifications
  - Type: Names the currently installed processor
  - Speed: Lists the processor speed
  - Count: The number of CPUs on the motherboard
- **System Memory**: Displays the auto-detected system memory.
  - Size: Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

6.3 Advanced

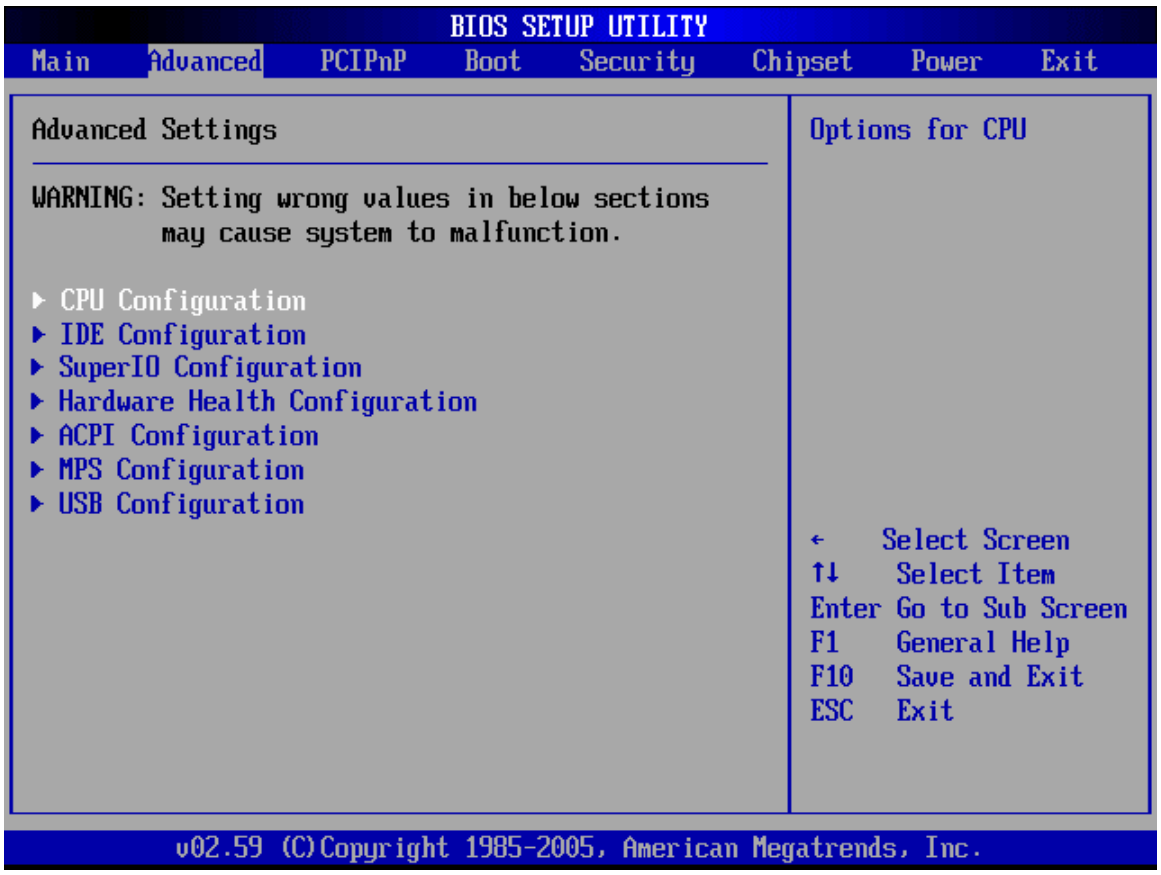
Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- CPU Configuration (see Section 6.3.1)
- IDE Configuration (see Section 6.3.2)
- SuperIO Configuration (see Section 6.3.3)
- Hardware Health Configuration (see Section 6.3.4)
- ACPI Configuration (see Section 6.3.5)

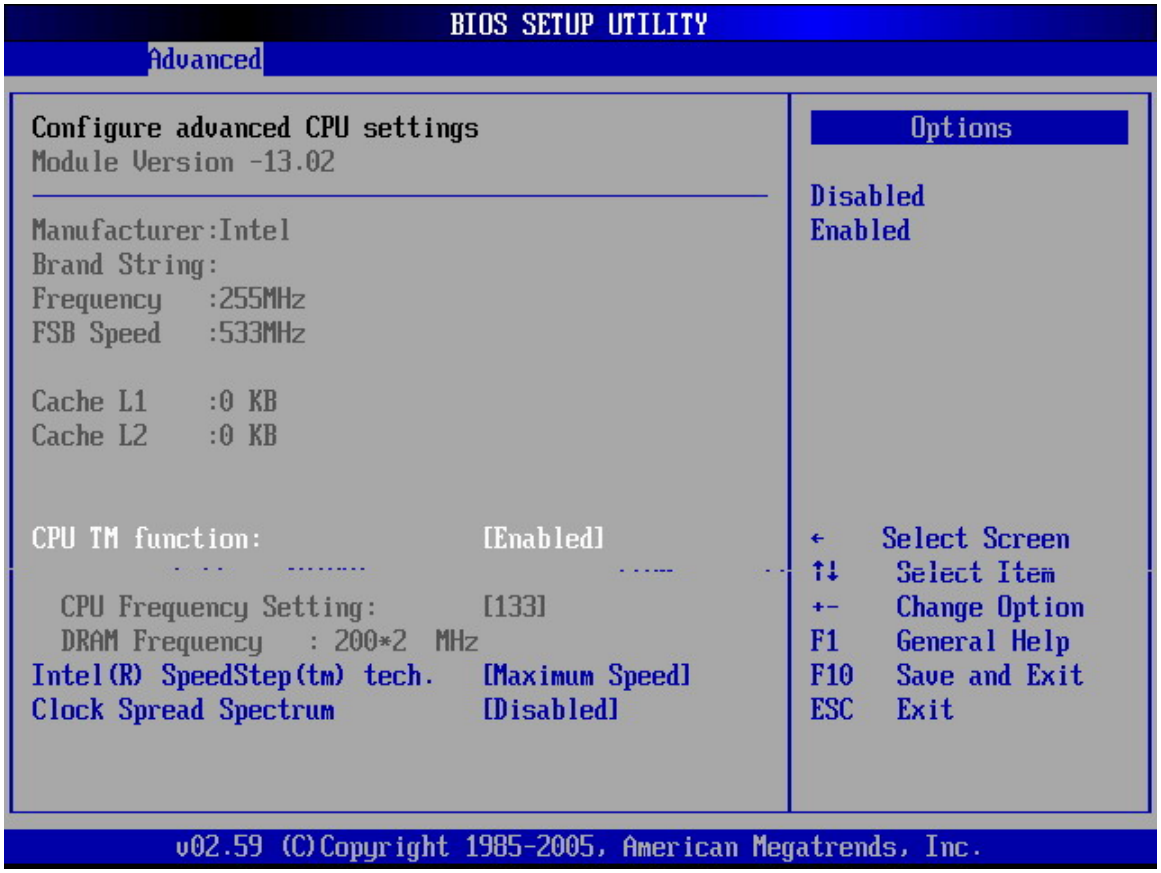
- MPS Configuration (see Section 6.3.6)
- USB Configuration (see Section 6.3.7)



BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Use the **CPU Configuration** menu (BIOS Menu 3) to view detailed CPU specifications and configure the CPU.



BIOS Menu 3: CPU Configuration

The CPU Configuration menu (BIOS Menu 3) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Brand String**: Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size

The following **CPU Configuration** menu items can be configured.

- CPU TM Function
- Intel ® SpeedStep ™ tech.
- Clock Spread Spectrum

➔ **Intel (R) SpeedStep (tm) tech. [Automatic]**

Use the **Intel (R) SpeedStep (tm) tech.** option to set the CPU speed.

➔ **Maximum Speed**	**DEFAULT**	CPU speed is set to maximum
➔ **Minimum Speed**		CPU speed is set to minimum
➔ **Disabled**		CPU speed is disabled

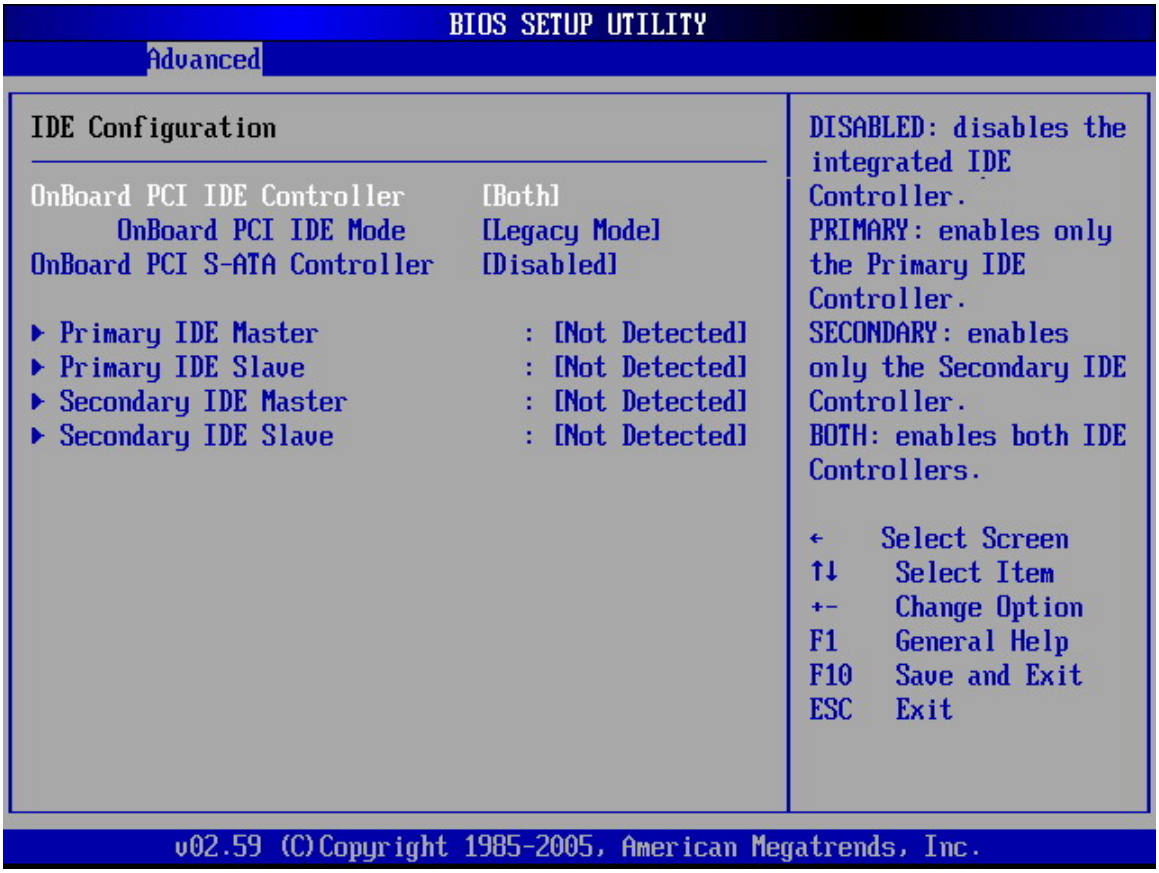
➔ **Clock Spread Spectrum [Disabled]**

The **Clock Spread Spectrum** BIOS option can help to improve CPU EMI issues.

➔ **Disabled**	(Default)	The clock spread spectrum is disabled
➔ **Enabled**		The clock spread spectrum is enabled

6.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **OnBoard PCI IDE Controller [Both]**

The **OnBoard PCI IDE Controller** BIOS option specifies the IDE channels used by the onboard PCI IDE controller. The following configuration options are available.

➔ **Disabled**		Disables all IDE controllers
➔ **Primary**		Only enables the primary IDE controller
➔ **Secondary**		Only enables the secondary IDE controller
➔ **Both**	Default	Enables both the primary and secondary IDE controllers

➔ **Onboard PCI IDE Mode [Native Mode]**

The **Onboard PCI IDE Mode** BIOS option sets the running mode for the PCI IDE.

➔ **Legacy Mode**		The PCI IDE mode will be the same as the IDE mode
➔ **Native Mode**	**DEFAULT**	The PCI IDE mode will be the native mode

➔ **Onboard PCI S-ATA Controller**

The **Onboard PCI S-ATA Controller** option sets the onboard SATA controller. If the RAID function is used (see **Appendix E**) this option must be set in the **RAID** mode.

➔ **Disabled**	**DEFAULT**	The onboard PCI SATA controller is disabled
➔ **Native Mode**		The SATA controller is set as an IDE device with ID at 0181h
➔ **Raid Mode**		The SATA controller is set as a RAID device with ID at 0181h

➔ **IDE Master and IDE Slave**

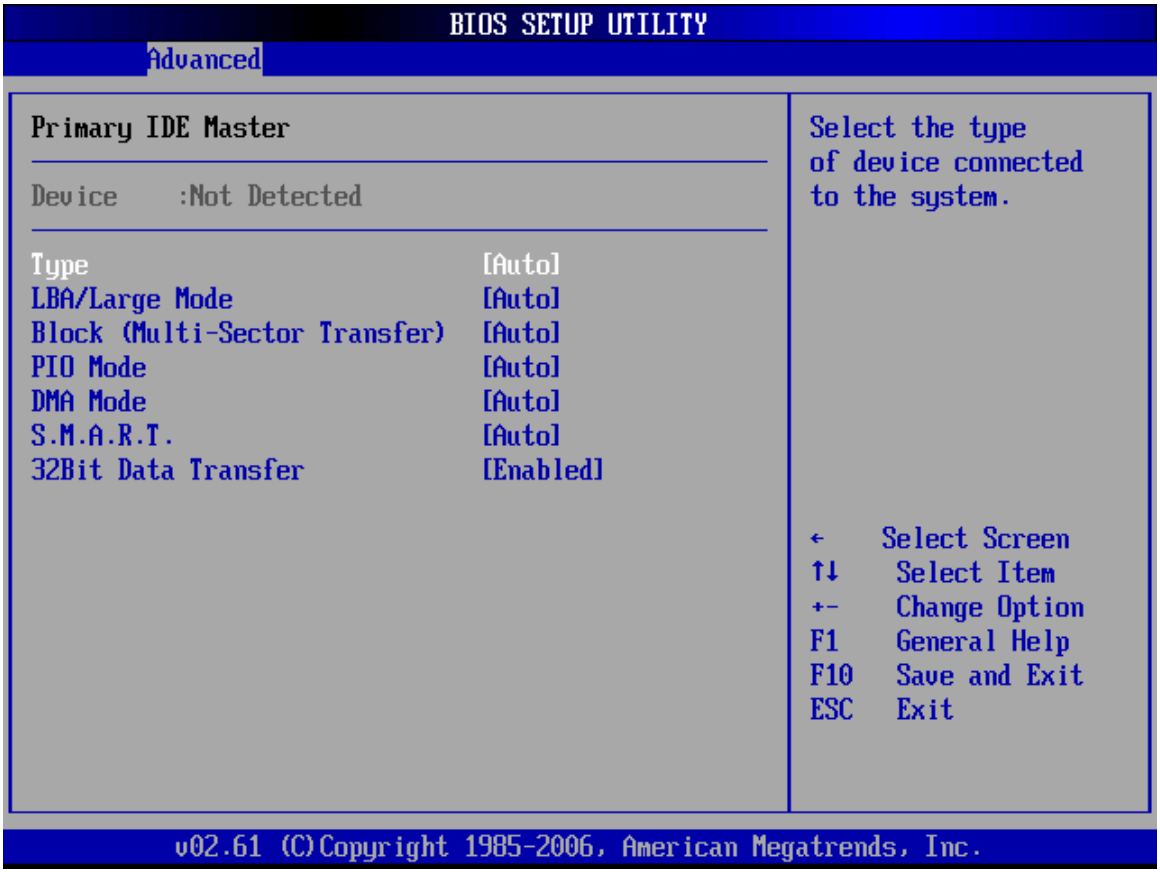
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **Vendor**: Lists the device manufacturer

- **Size**: List the storage capacity of the device.
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

➔ **ZIP**

➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**		BIOS is prevented from using the LBA mode control on the specified channel.
➔ **Auto**	**DEFAULT**	BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**		BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
➔ **Auto**	**DEFAULT**	BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

- ➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
- ➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps
- ➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps
- ➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps
- ➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps
- ➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps

  (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

- ➔ **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- ➔ **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
- ➔ **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
- ➔ **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
- ➔ **MWDMA0** Multi Word DMA mode 0 selected with a maximum data

transfer rate of 4.2MBps

➔ **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps

➔ **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps

➔ **UDMA1** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps

➔ **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps

➔ **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps

➔ **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto** **DEFAULT** BIOS auto detects HDD SMART support.

➔ **Disabled** Prevents BIOS from using the HDD SMART feature.

➔ **Enabled** Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

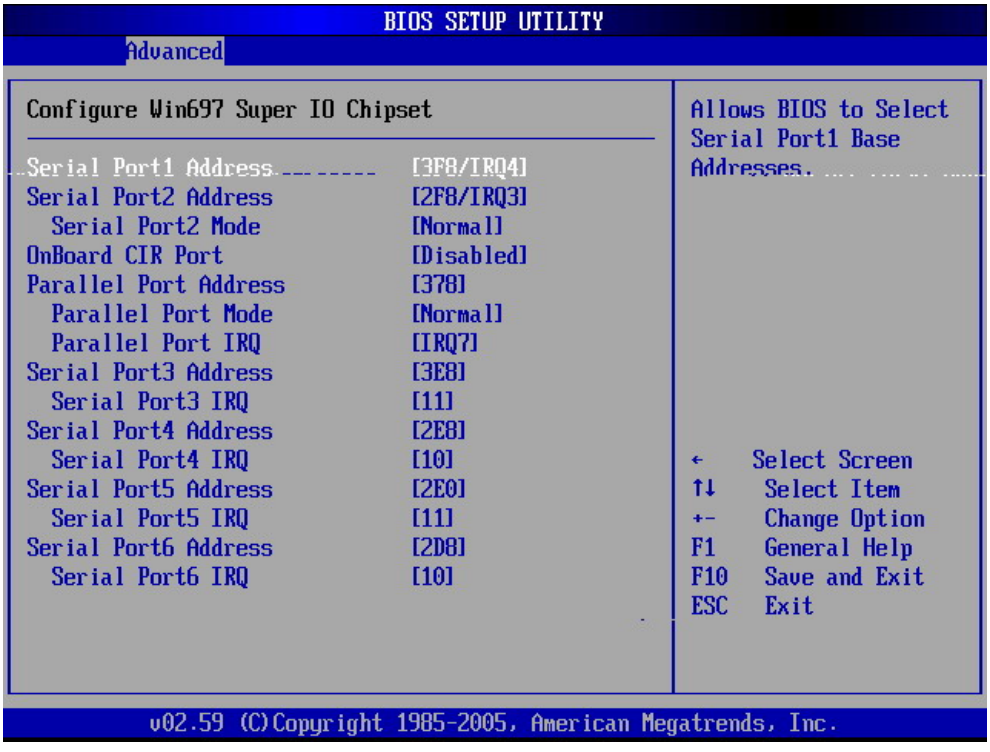
Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

6.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8/IRQ4**	**DEFAULT**	Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8/IRQ4**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	**DEFAULT**	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
➔ **3E8/IRQ4**		Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

➔ **Normal**	**DEFAULT**	Serial Port 2 mode is normal
➔ **IrDA**		Serial Port 2 mode is IrDA

- ➔ **ASK IR** Serial Port 2 mode is ASK IR

➔ **Onboard CIR Port [Disabled]**

Use the **Onboard CIR Port** option to select the CIR base address.

- ➔ **Disabled** **DEFAULT** No base address is assigned to CIR
- ➔ **3E0** CIR base address is 3E0
- ➔ **2E0** CIR base address is 2E0

➔ **Parallel Port Address [Disabled]**

Use the **Parallel Port Address** option to select the parallel port base address.

- ➔ **Disabled** **DEFAULT** No base address is assigned to the Parallel Port
- ➔ **378** Parallel Port I/O port address is 378
- ➔ **278** Parallel Port I/O port address is 278
- ➔ **3BC** Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

- ➔ **Normal** **DEFAULT** The normal parallel port mode is the standard mode for parallel port operation.
- ➔ **Bi-directional** Parallel port outputs are 8-bits long. Inputs are accomplished by reading 4 of the 8 bits on the status register.
- ➔ **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system

and the parallel port device and the transmission rates between the two are much faster than the Normal mode.

➔ **ECP+EPP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

The parallel port is also be compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address

➔ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

➔ **Disabled** No base address is assigned to serial port 3

➔ **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8

➔ **2E8** Serial port 3 I/O port address is 2E8

➔ **2E0** Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

- ➔ **4** Serial port 3 IRQ address is 4
- ➔ **9** Serial port 3 IRQ address is 9
- ➔ **10** Serial port 3 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3E8** Serial port 4 I/O port address is 3E8
- ➔ **2E8** **DEFAULT** Serial port 4 I/O port address is 2E8
- ➔ **2E0** Serial port 4 I/O port address is 2E0

➔ **Serial Port4 IRQ [10]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- ➔ **3** **DEFAULT** Serial port 4 IRQ address is 3
- ➔ **9** Serial port 4 IRQ address is 9
- ➔ **10** **DEFAULT** Serial port 4 IRQ address is 10
- ➔ **11** Serial port 4 IRQ address is 11

➔ **Serial Port5 Address [2E0]**

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

- ➔ **Disabled** No base address is assigned to serial port 5
- ➔ **3E8** Serial port 5 I/O port address is 3E8

- ➔ **2E8** Serial port 5 I/O port address is 2E8
- ➔ **2E0** **DEFAULT** Serial port 5 I/O port address is 2E0
- ➔ **2D0** Serial port 5 I/O port address is 2D0

➔ **Serial Port5 IRQ [11]**

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

- ➔ **10** Serial port 5 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 5 IRQ address is 11

➔ **Serial Port6 Address [2D8]**

Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

- ➔ **Disabled** No base address is assigned to serial port 6
- ➔ **3E8** Serial port 6 I/O port address is 3E8
- ➔ **2E8** Serial port 6 I/O port address is 2E8
- ➔ **2E0** Serial port 6I/O port address is 2E0
- ➔ **2D8** **DEFAULT** Serial port 6 I/O port address is 2D8

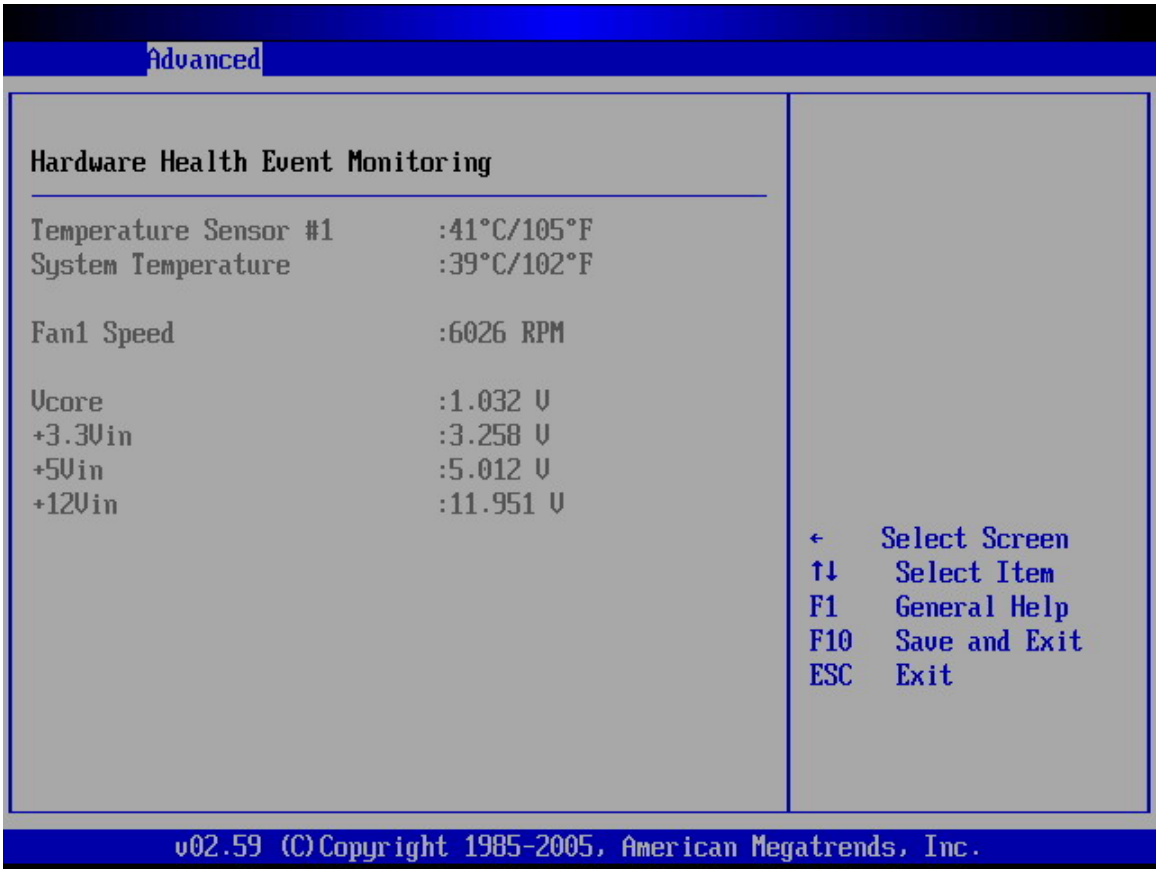
➔ **Serial Port6 IRQ [10]**

Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

- ➔ **10** **DEFAULT** Serial port 6 IRQ address is 10
- ➔ **11** Serial port 6 IRQ address is 11

6.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.



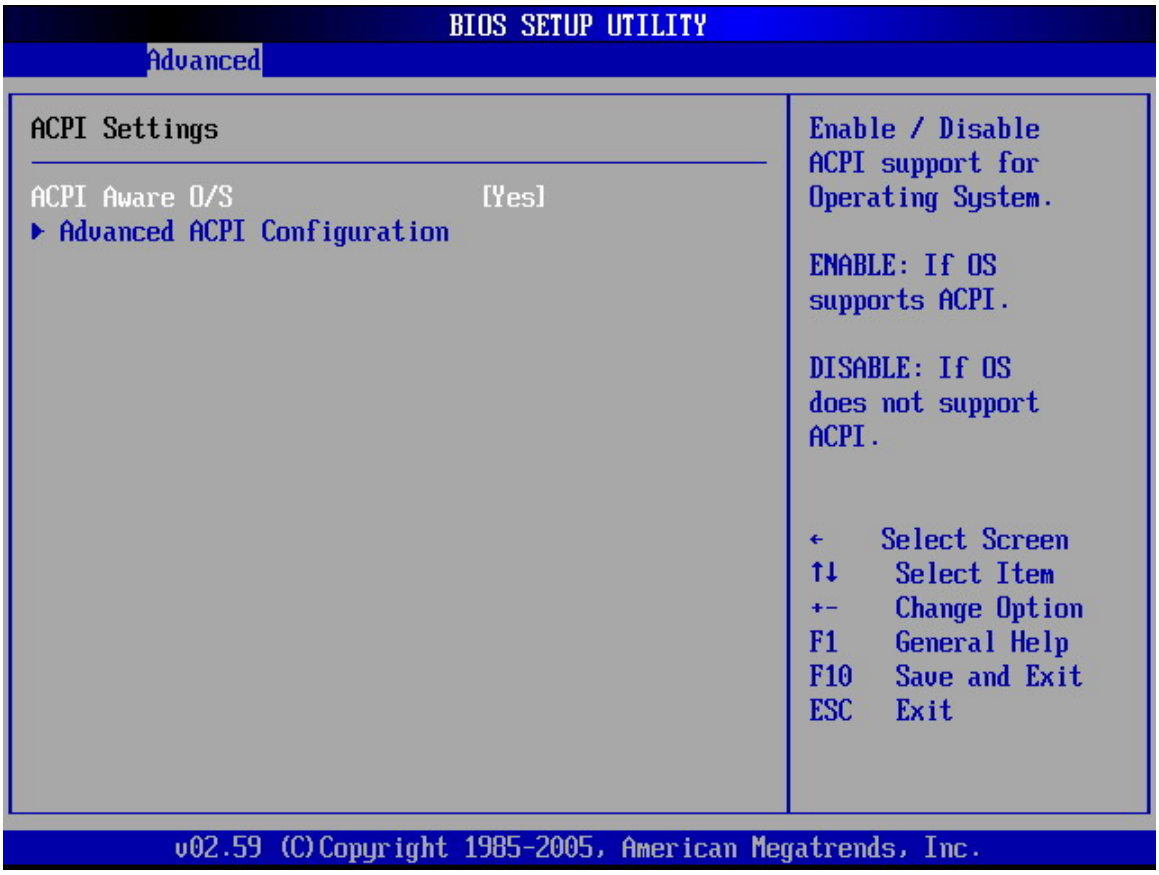
BIOS Menu 7: Hardware Health Configuration

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - Temperature Sensor #1
  - System Temperature
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - Fan1 Speed
- **Voltages**: The following system voltages are monitored
  - Vcore
  - +3.30Vin
  - +5.00Vin
  - +12Vin

6.3.5 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 8**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 8: ACPI Configuration

➔ **ACPI Aware O/S [Yes]**

ACPI Aware O/S can only be configured if the OS complies with the ACPI standard. Windows 98, Windows 2000, and Windows XP all comply with ACPI.

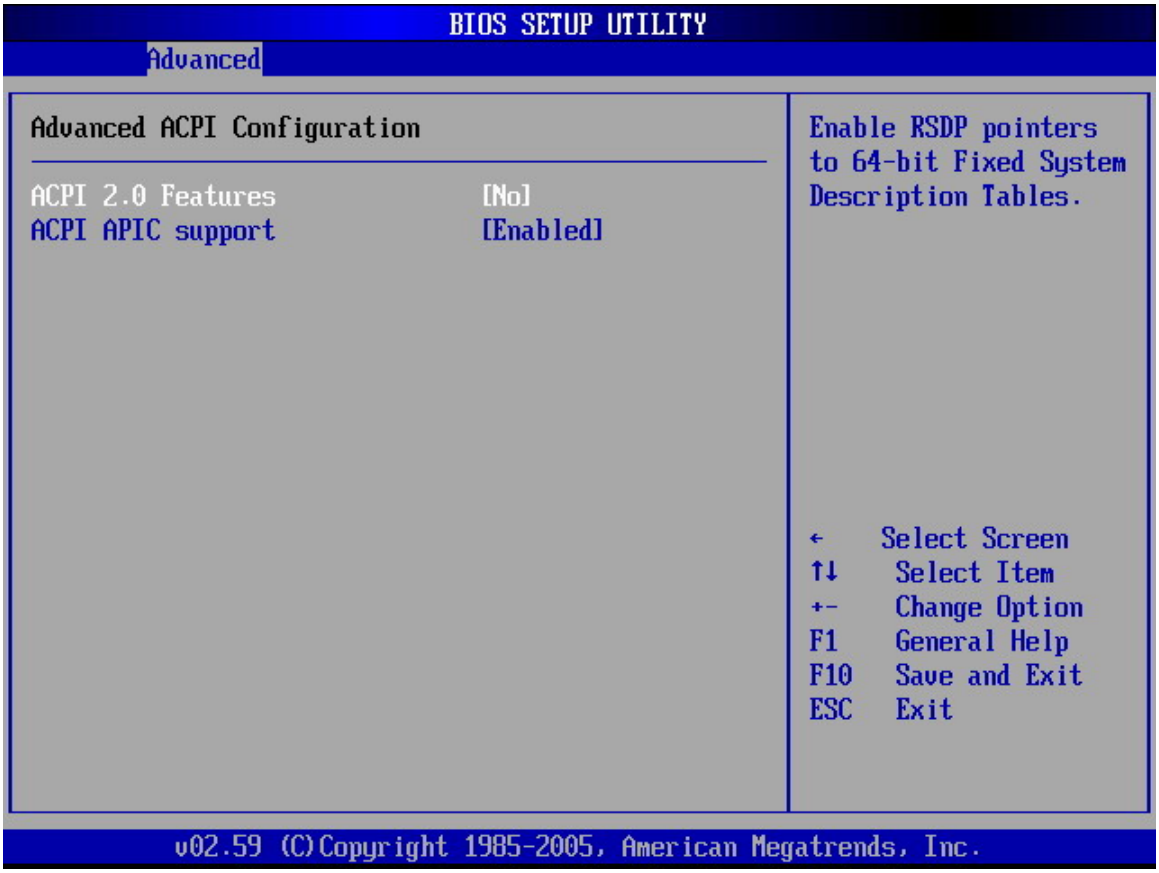
➔ **No** Disables the ACPI support for the OS. This selection should be disabled if the OS does not support ACPI

➔ **Yes** (Default) Enables the ACPI support for the operating system. This

selection should be enabled if the OS does support ACPI

6.3.5.1 Advanced ACPI Configuration

The Advanced ACPI Configuration menu (BIOS Menu 9) selects the ACPI state when the system is suspended.



BIOS Menu 9: General ACPI Configuration

➔ **ACPI 2.0 Features**

The **ACPI 2.0 Features** BIOS option enables the ACPI (Advanced Configuration and Power Interface) features. By enabling this feature the system RSDP (Root System Description Pointer) is able to obtain physical addresses for other 64-bit fixed system description tables.

➔ **No** (Default) RSDP pointers to 64-bit fixed systems are not provided to the system

➔ **Yes** RSDP pointers to 64-bit fixed systems are provided to the system

➔ **ACPI APIC Support [Enabled]**

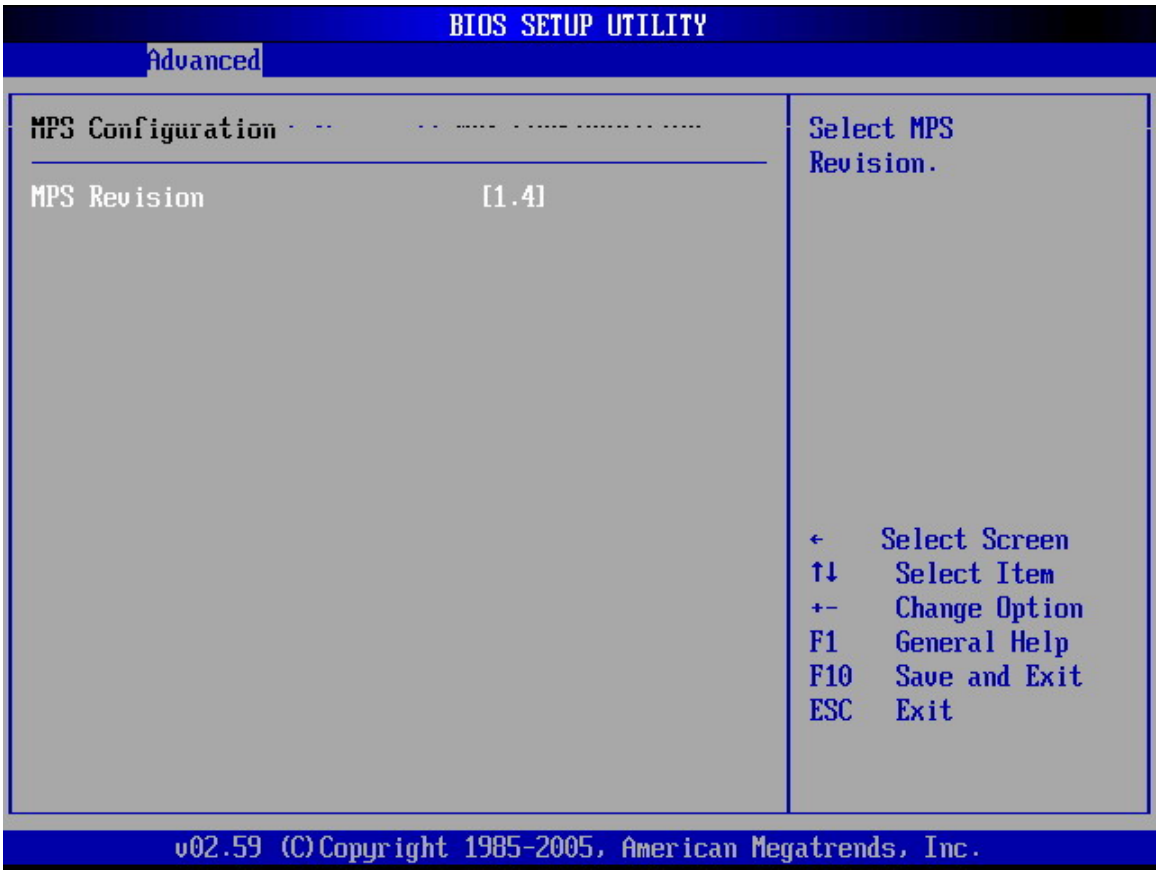
The **ACPI APIC Support** BIOS option adds a pointer to an ACPI APIC table in the RSDT (Root System Description Table). The RSDT is an array of pointers that direct the system to the physical addresses of other description tables. The RSDT is the main ACPI table. The RSDP is located in low memory space of the system. It provides the physical address of the RSDT. The RSDT itself is identified in memory because it starts with the signature "RSDT."

➔ **Disabled** Pointers to the APIC APIC table are not be provided in the RSDT

➔ **Enabled** (Default) A pointers to the APIC APIC table are provided in the RSDT

6.3.6 MPS Configuration

The MPS Configuration menu (BIOS Menu 10) configures the multi-processor table.



BIOS Menu 10: MPS Configuration

➔ **MPS Revision [1.1]**

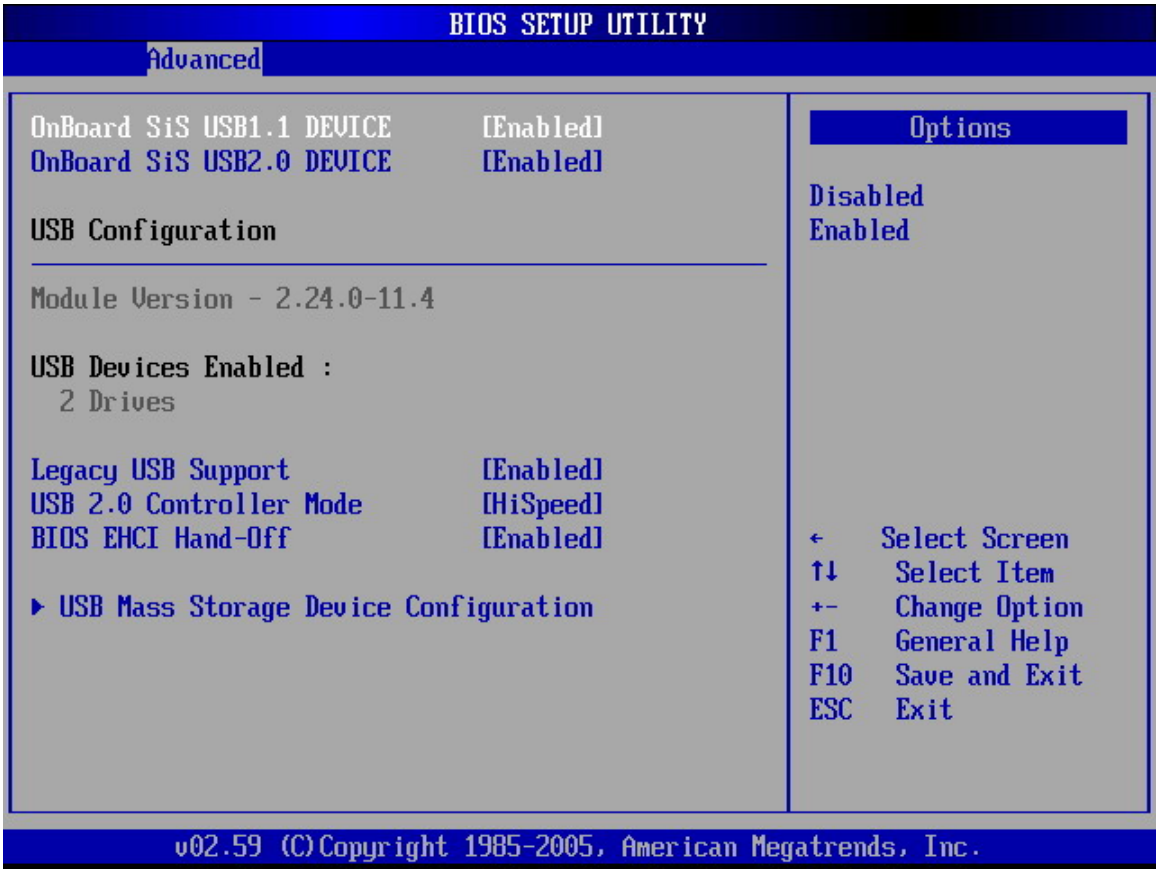
The **Multiprocessor Specification (MPS) for OS** specifies the MPS version to be used.

➔ **1.1** (Default) MPS version 1.1 is used

➔ **1.4** MPS version 1.4 is used

6.3.7 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 11**) to read USB configuration information and configure the USB settings.



BIOS Menu 11: USB Configuration

➔ **Onboard SiS USB1.1 DEVICE [Enabled]**

The Onboard **SiS USB1.1 DEVICE** BIOS option enables or disables the onboard SiS USB1.1 controller. If disabled, USB1.1 devices cannot be used on the system.

➔ **Disabled** USB 1.1 interface is disabled and cannot be used.

➔ **Enabled** **DEFAULT** USB 1.1 interface is enabled and can be used.

➔ **Onboard SiS USB2.0 DEVICE [Enabled]**

The Onboard **SiS USB2.0 DEVICE** BIOS option enables or disables the onboard SiS USB2.0 controller. If disabled, USB2.0 devices cannot be used on the system.

➔ **Disabled** USB 2.0 interface is disabled and cannot be used.

➔ **Enabled** **DEFAULT** USB 2.0 interface is enabled and can be used.

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled** Legacy USB support disabled

➔ **Enabled** **DEFAULT** Legacy USB support enabled

➔ **Auto** Legacy USB support disabled if no USB devices are connected

➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔ **FullSpeed** **DEFAULT** The controller is capable of operating at 12Mb/s

➔ **HiSpeed** The controller is capable of operating at 480Mb/s

➔ **BIOS EHCI Handoff**

Use the **BIOS EHCI Handoff** option for systems running OSes that do not have EHCI hand-off support. The EHCI ownership change is managed by the EHCI driver.

➔ **Disabled** Systems with OSes that do not support EHCI can use the EHCI handoff functionality.

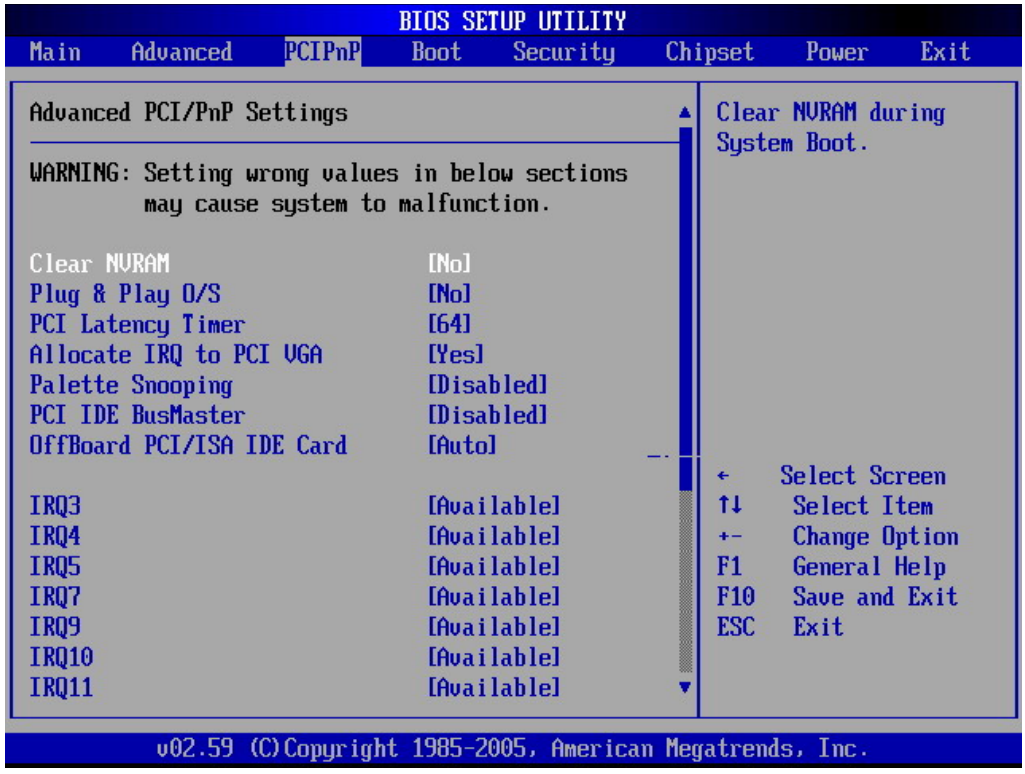
➔ **Enabled** **DEFAULT** Systems with OSes that do not support EHCI cannot use the EHCI handoff functionality.

6.4 PCI/PnP

Use the PCI/PnP menu (BIOS Menu 12) to configure advanced PCI and PnP settings.

WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.



BIOS Menu 12: PCI/PnP Configuration

➔ **Clear NVRAM [No]**

Use the **Clear NVRAM** option to specify if the NVRAM (Non-Volatile RAM) is cleared when the power is turned off.

➔ **No** **DEFAULT** System does not clear NVRAM during system boot

➔ **Yes** System clears NVRAM during system boot

➔ **Plug & Play O/S [No]**

Use the **Plug & Play O/S** BIOS option to specify whether system plug and play devices are configured by the operating system or the BIOS.

➔ **No** **DEFAULT** If the operating system does not meet the Plug and Play specifications, this option allows the BIOS to configure all the devices in the system.

➔ **Yes** This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

➔ **PCI Latency Timer [64]**

Use the **PCI Latency Timer** option to specify the PCI latency time. The latency time is measured in units of PCI clock cycles for the PCI device latency timer register. Configuration options are:

- 32
- 64 Default
- 96
- 128
- 160
- 192
- 224
- 248

➔ **Allocate IRQ to PCI VGA [Yes]**

Use the **Allocate IRQ to PCI VGA** option to restrict the system from giving the VGA adapter card an interrupt address.

➔ **Yes**	**DEFAULT**	Assigns an IRQ to a PCI VGA card if card requests IRQ
➔ **No**		Does not assign IRQ to a PCI VGA card even if the card requests an IRQ

➔ **Palette Snooping [Disabled]**

Use the **Palette Snooping** option to enable or disable the palette snooping function.

➔ **Disabled**	**DEFAULT**	Unless the VGA card manufacturer requires palette snooping to be enabled, this option should be disabled.
➔ **No/Enabled**		PCI devices are informed that an ISA based Graphics device is installed in the system so the ISA based Graphics card functions correctly. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with the adapter card manual first, before modifying the default settings in the BIOS.

➔ **PCI IDE BusMaster [Disabled]**

Use the **PCI IDE BusMaster** BIOS option to enable or prevent PCI IDE busmastering.

➔ **Disabled**	**DEFAULT**	Busmastering is prevented
➔ **No/Enabled**		IDE controller on the PCI local bus has mastering capabilities

➔ **OffBoard PCI/ISA IDE Card [Auto]**

Use the OffBoard PCI/ISA IDE Card BIOS option to select the OffBoard PCI/ISA IDE Card.

➔ **Auto**	**DEFAULT**	The location of the Off Board PCI IDE adapter card is automatically detected by the AMIBIOS.
➔ **PCI Slot 1**		PCI Slot 1 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 1.
➔ **PCI Slot 2**		PCI Slot 2 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 2.
➔ **PCI Slot 3**		PCI Slot 3 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 3.
➔ **PCI Slot 4**		PCI Slot 4 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 4.
➔ **PCI Slot 5**		PCI Slot 5 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 5.
➔ **PCI Slot 6**		PCI Slot 6 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 6.

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available**	**DEFAULT**	The specified IRQ is available to be used by PCI/PnP devices
➔ **Reserved**		The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available**	**DEFAULT**	The specified DMA is available to be used by PCI/PnP devices
➔ **Reserved**		The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0

- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

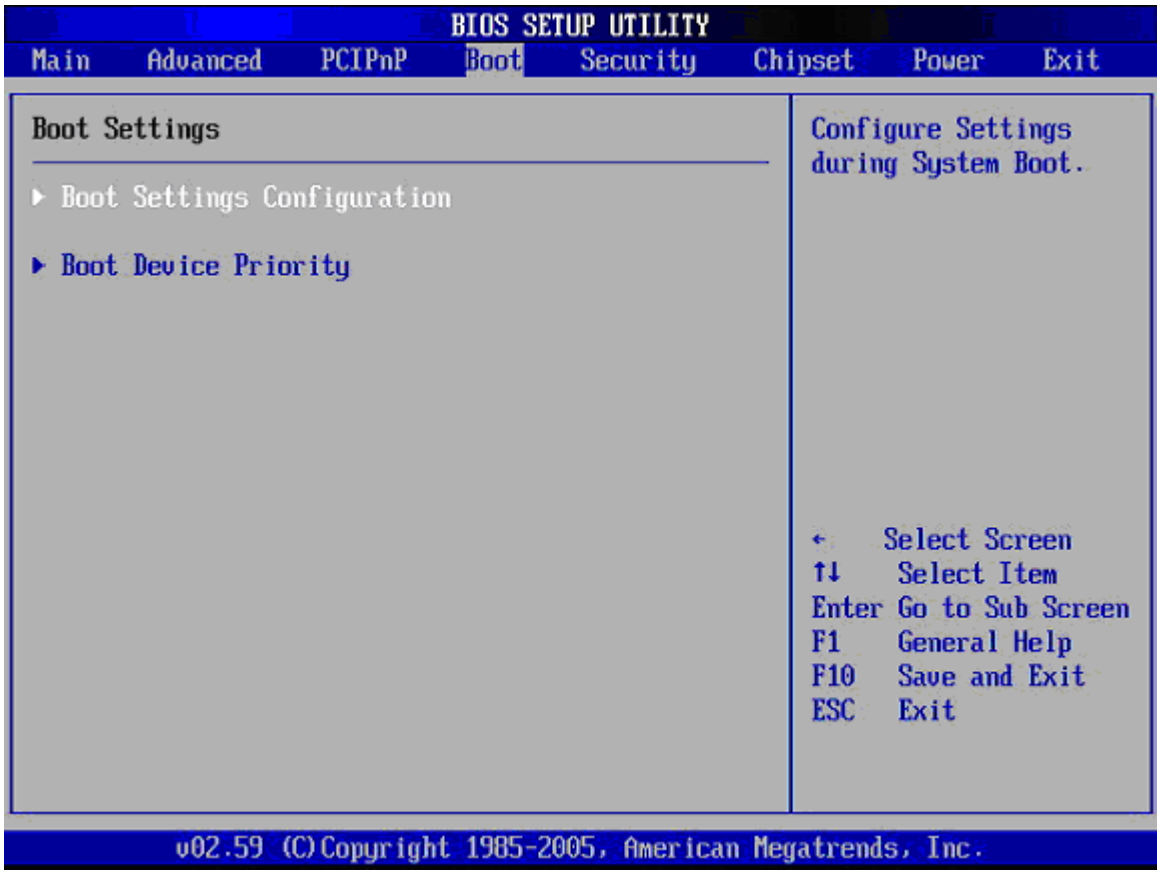
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔	**Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔	**16K**		16KB reserved for legacy ISA devices
➔	**32K**		32KB reserved for legacy ISA devices
➔	**64K**		54KB reserved for legacy ISA devices

6.5 Boot

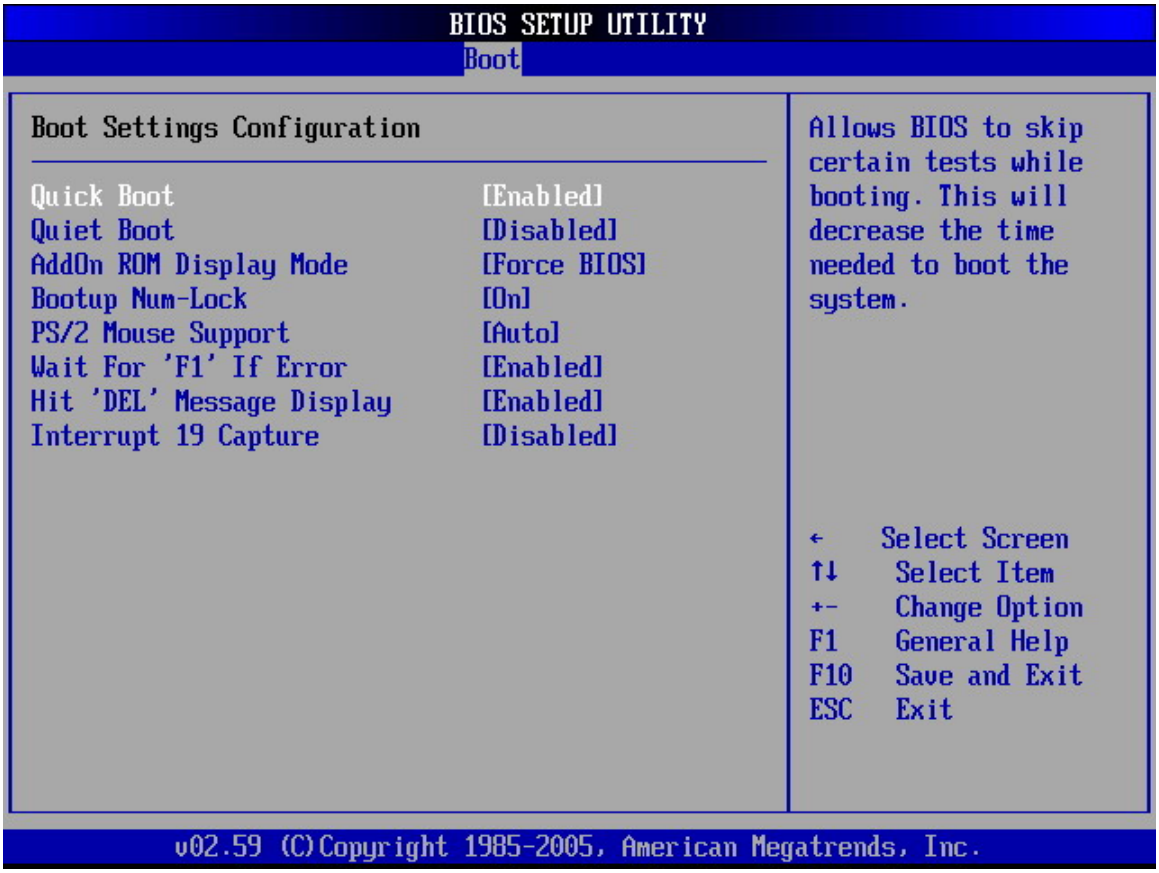
Use the Boot menu (BIOS Menu 13) to configure system boot options.



BIOS Menu 13: Boot

6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (BIOS Menu 13) to configure advanced system boot options.



BIOS Menu 14: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed

➔ **Enabled** OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

The **AddOn ROM Display Mode** option allows add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS** **DEFAULT** Allows the computer system to force a third party BIOS to display during system boot.

➔ **Keep Current** Allows the computer system to display the information during system boot.

➔ **Bootup Num-Lock [Off]**

The **Bootup Num-Lock** BIOS option allows the Number Lock setting to be modified during boot up.

➔ **Off** **DEFAULT** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **PS/2 Mouse Support [Enabled]**

Use the **PS/2 Mouse Support** option adjusts PS/2 mouse support capabilities.

➔ **Disabled**		PS/2 mouse support is disabled and prevented from using system resources.
➔ **Enabled**	**DEFAULT**	Allows the system to use a PS/2 mouse.
➔ **Auto**		The system auto-adjusts PS/2 mouse support.

➔ **Wait For 'F1' If Error [Enabled]**

Use the **Wait For 'F1' if Error** option to specify how the system responds when the system detects an error on boot up.

➔ **Disabled**		If there is an error when booting up, the system does not wait for user intervention but continues to boot up in the operating system. Only use this setting if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard currently attached.
➔ **Enabled**	**DEFAULT**	If there is an error during boot up, the system waits for a user to press "F1" and enter the BIOS to rectify the problem. The BIOS can then be adjusted to the correct settings.

➔ **Hit 'DEL' Message Display [Enabled]**

Use the **Hit "DEL" Message Display** option to specify whether the instruction to hit the delete button to enter BIOS during POST appears or not.

➔ **Disabled**		No message displayed during POST
➔ **Enabled**	**DEFAULT**	Displays "**Press DEL to run Setup**" message in POST

➔ **Interrupt 19 Capture [Disabled]**

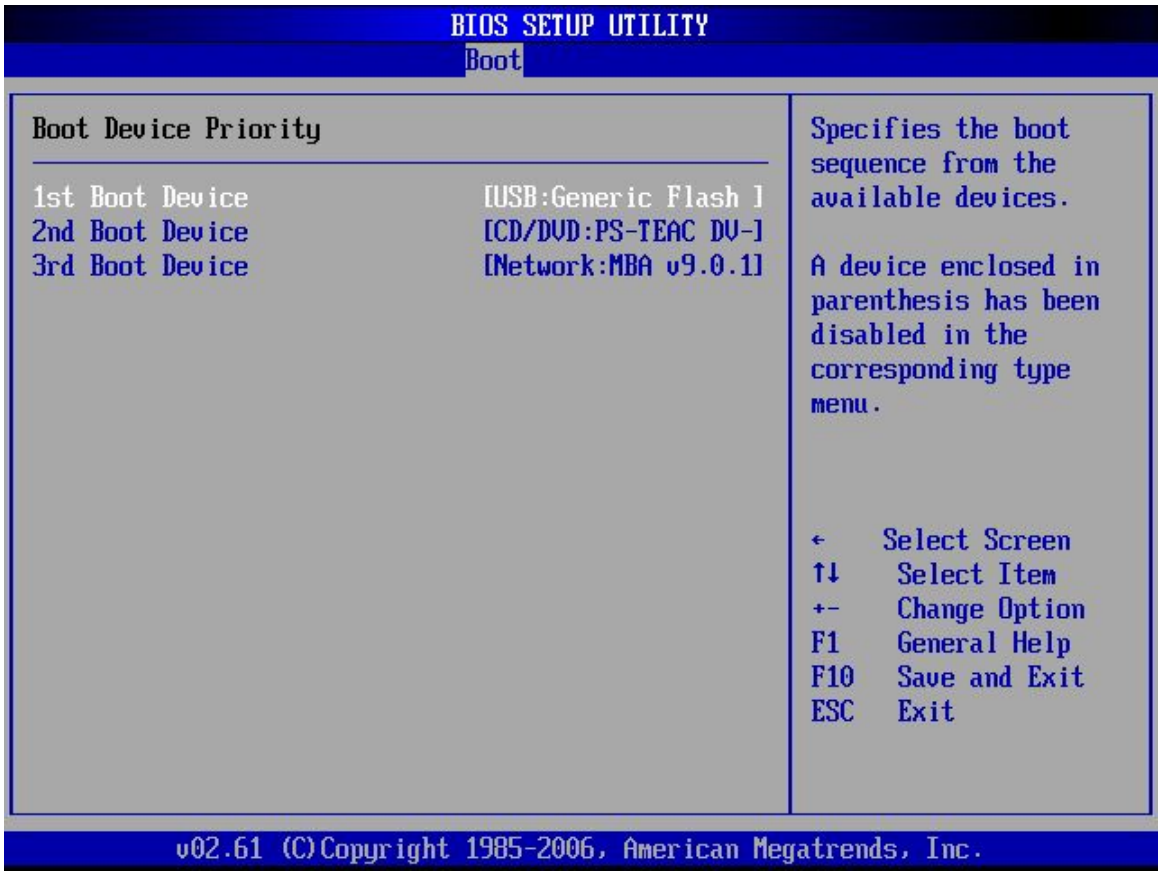
Use the **Interrupt 19 Capture** option to allow optional ROMs such as network controllers to trap BIOS interrupt 19.

➔	**Disabled**	**DEFAULT**	Does not allow optional ROM to trap interrupt 19
➔	**Enabled**		Allows optional ROM to trap interrupt 19

6.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 15**) to specify the boot sequence from the available devices. The following options are available:

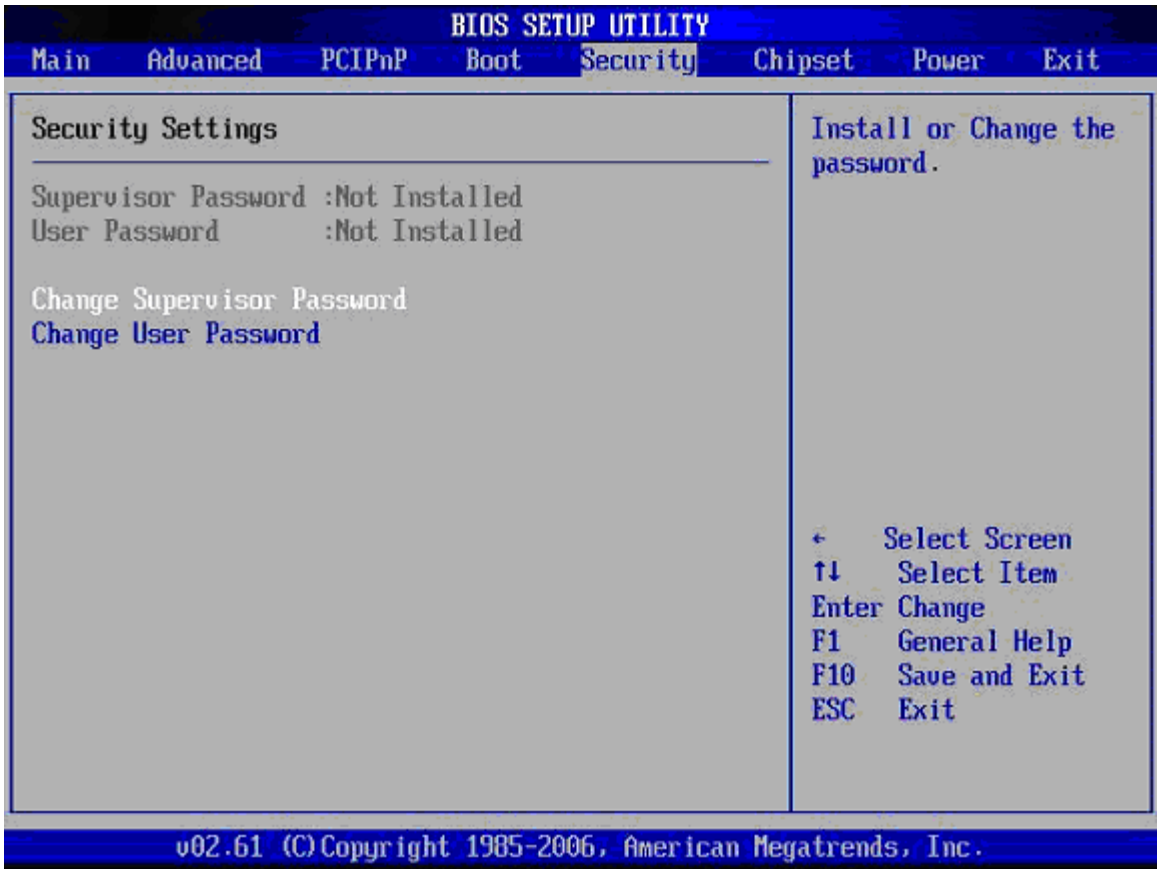
- 1st Boot Device
- 2nd Boot Device
- 3rd Boot Device
-



BIOS Menu 15: Boot Device Priority Settings

6.6 Security

Use the Security menu (BIOS Menu 16) to set system and user passwords.



BIOS Menu 16: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

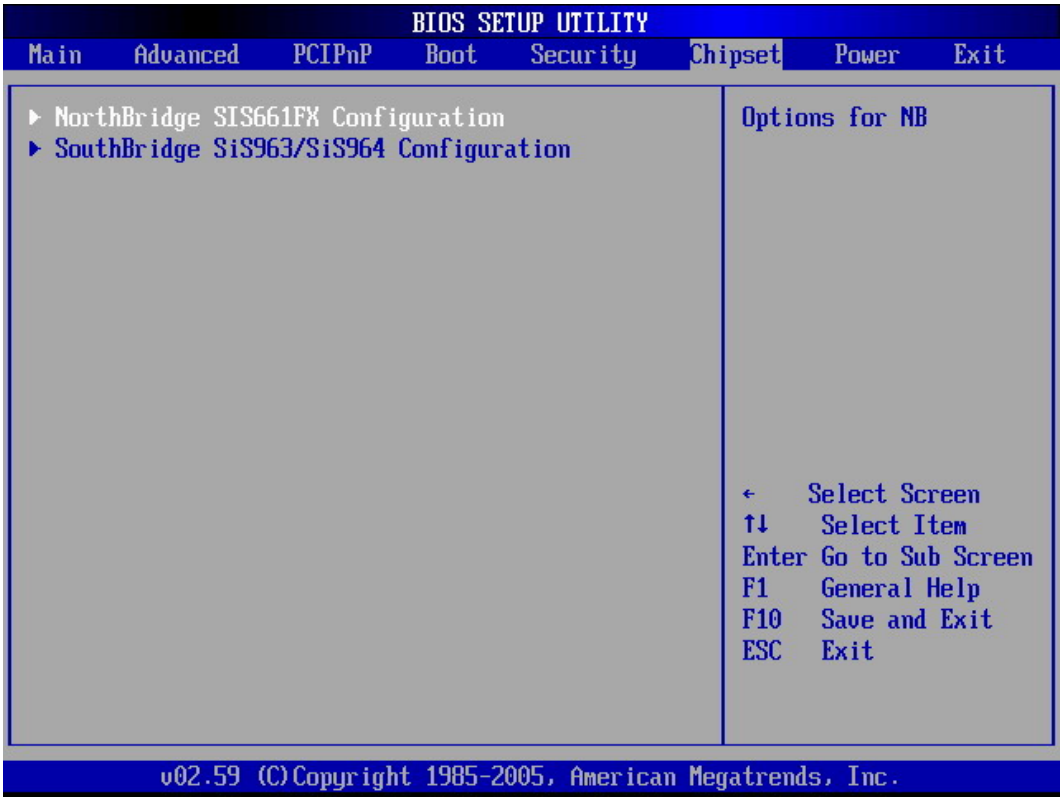
Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

6.7 Chipset

Use the **Chipset** menu (**BIOS Menu 17**) to access the NorthBridge and SouthBridge configuration menus

WARNING!

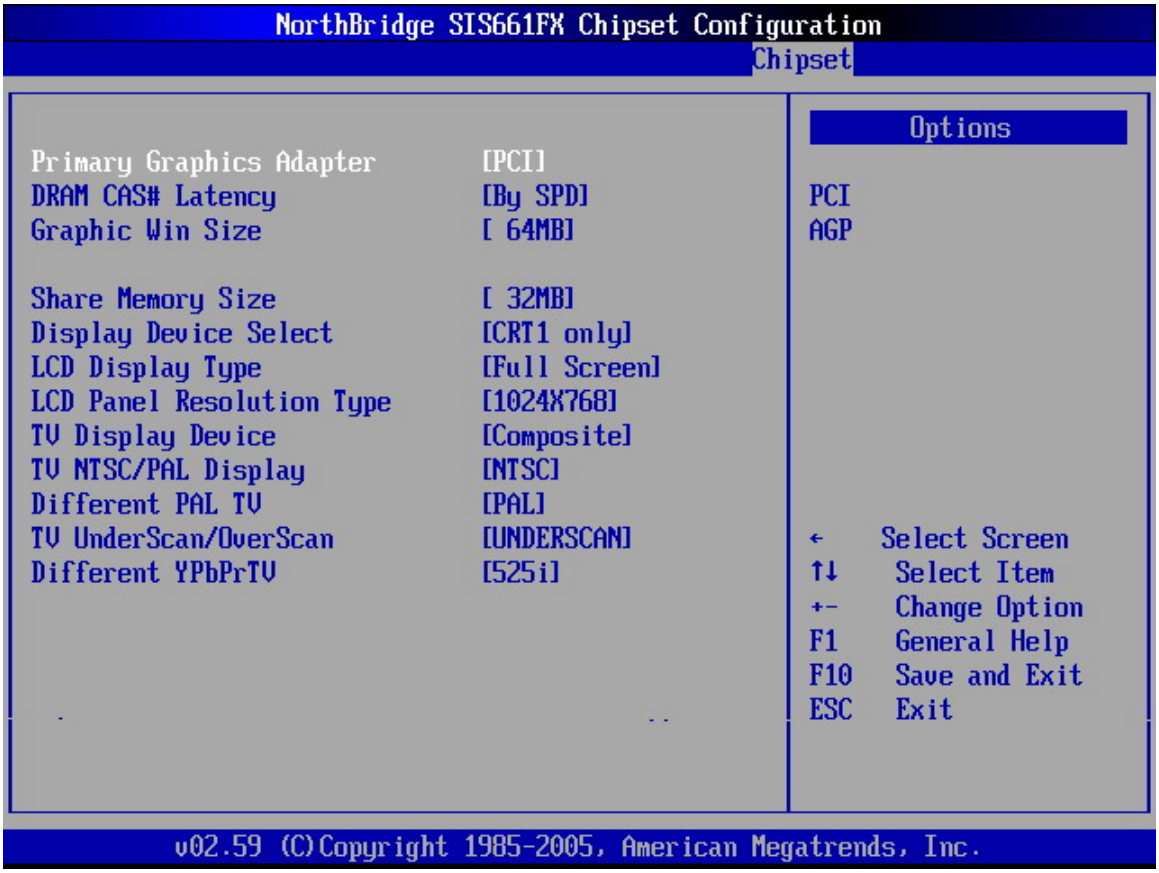
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 17: Chipset

6.7.1 NorthBridge SiS963/964 Chipset Configuration

Use the **NorthBridge SiS963/964 Chipset Configuration** menu (BIOS Menu 17) to configure the Northbridge chipset settings.



BIOS Menu 18:NorthBridge Chipset Configuration

➔ **Primary Graphics Adapter [PCI]**

Use the **Primary Graphics Adapter** option to select the graphics adapter the system is connected to.

➔ **PCI** **DEFAULT** PCI graphics adapter is used

➔ **AGP** AGP graphics adapter is used

➔ **DRAM CAS# Latency [By SPD]**

The **DRAM CAS# Latency** option sets the CAS (Column Address Strobe) latency. The CAS latency is the number of clock cycles (or Ticks, denoted with T) between the receipt of a "read" command and when the ram chip actually starts reading. The BIOS options are as follows:

- By SPD **DEFAULT**
- 2T
- 2.5T
- 3T

➔ **Graphic Win Size [64MB]**

The **Graphic Win Size** selects the size of the AGP aperture and the size of the GART (Graphics Address Relocation Table). The aperture is a portion on the PCI memory address range dedicated for use as AGP memory address space and the GART is a translation table that translates the AGP memory addresses into actual addresses. The following options are available.

- 32MB
- 64MB
- 128MB

➔ **Share Memory Size [32MB]**

The Share Memory Size BIOS feature allocates the maximum amount of system memory to the integrated graphics processor. The options are:

- 16MB
- 32MB
- 64MB Default
- 128MB
- Disabled

➔ **Display Device Select [CRT1 only]**

Use the **Display Device Select** BIOS feature to determine what displays are used. Dual display functionality is enabled here. Dual display configuration options are listed below:

- CTR1 only **DEFAULT**
- CRT1 + LCD
- CRT1 + TV
- CRT1 + CRT2

➔ **LCD Display Type [Full Screen]**

Use the **LCD Display Type** BIOS to specify the screen display type. Configuration options are listed below:

- Full Screen **DEFAULT**
- Center Screen

➔ **LCD Panel Resolution Type**

Use the **LCD Panel Resolution Type** to determine the LCD panel resolution. Configuration options are listed below:

- 1024 x 768
- 1280 x 1924
- 1400 x 1050
- 1280 x 768 (HT x VT = 1688 x 806)
- 1600 x 1200
- 1280 x 768 (HT x VT = 1408 x 806)

➔ **TV NTSC/PAL Display [NTSC]**

Use the **TV NTSC/PAL Display** option to specify the TV format:

- NTSC (Default)
- PAL

➔ **Different PAL TV [PAL]**

Use the **Different PAL TV** option specifies the PAL format of the TV graphics card use. Configuration options are listed below.

- PAL
- PAL-M
- PAL-N

➔ **TV UnderScan/OverScan**

Use the **TV UnderScan/OverScan** option to specify whether overscan or underscan functionalities are enabled on the system. Configuration options are listed below.

- UNDERSCAN
- OVERSCAN

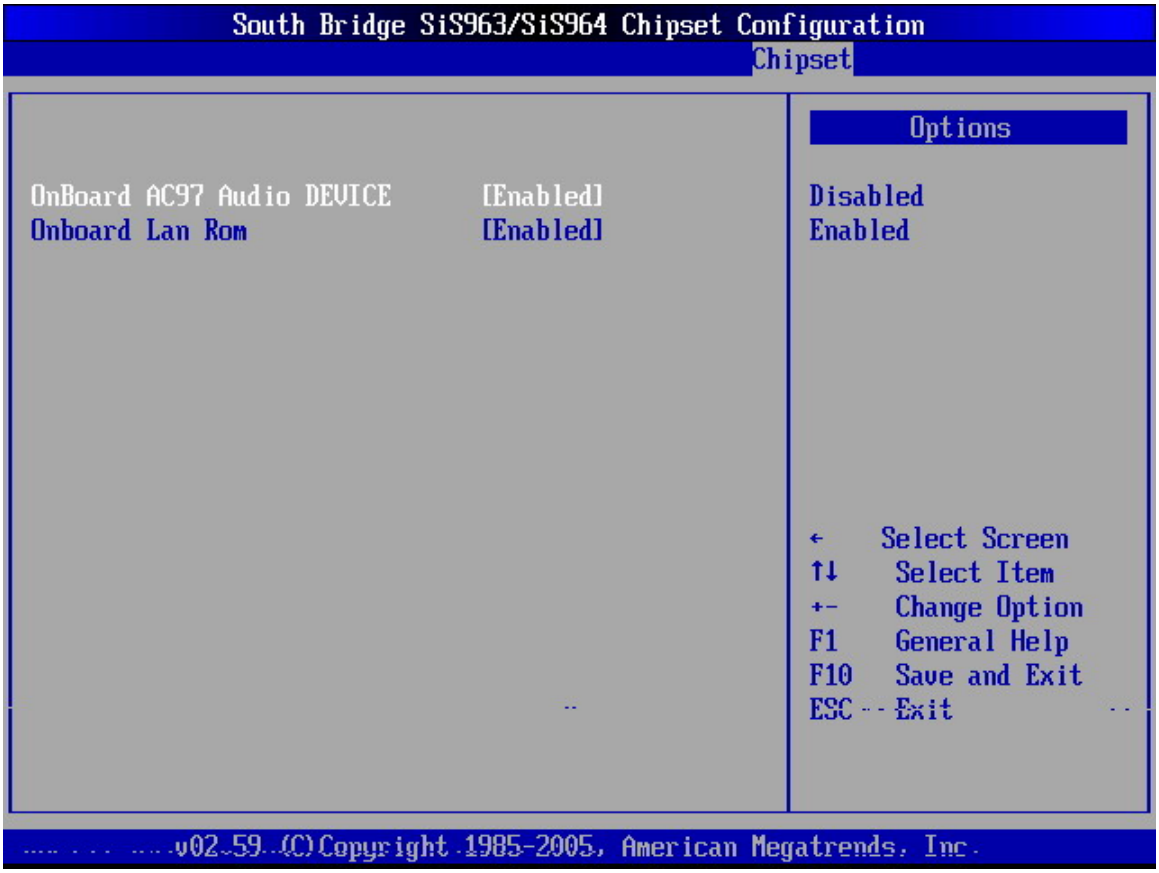
➔ **Different YPbPrTV**

Use the **Different YPbPrTV** option to specify the YPbPr TV settings. Configuration options are listed below.

- 515i
- 525p
- 750p
- 1080i

6.7.2 SouthBridge Configuration

The **SouthBridge Configuration** menu (BIOS Menu 19) the southbridge chipset to be configured.



BIOS Menu 19:SouthBridge Chipset Configuration

➔ **OnBoard AC97 Audio Device**

The **OnBoard AC97 Audio Device** option enables or disables the AC'97 CODEC.

➔ **Disabled** The onboard AC'97 is disabled

➔ **Auto** **DEFAULT** The onboard AC'97 automatically detected and enabled

➔ **OnBoard Lan Rom [Enabled]**

The **OnBoard Lan Rom** option enables or disables the onboard LAN.

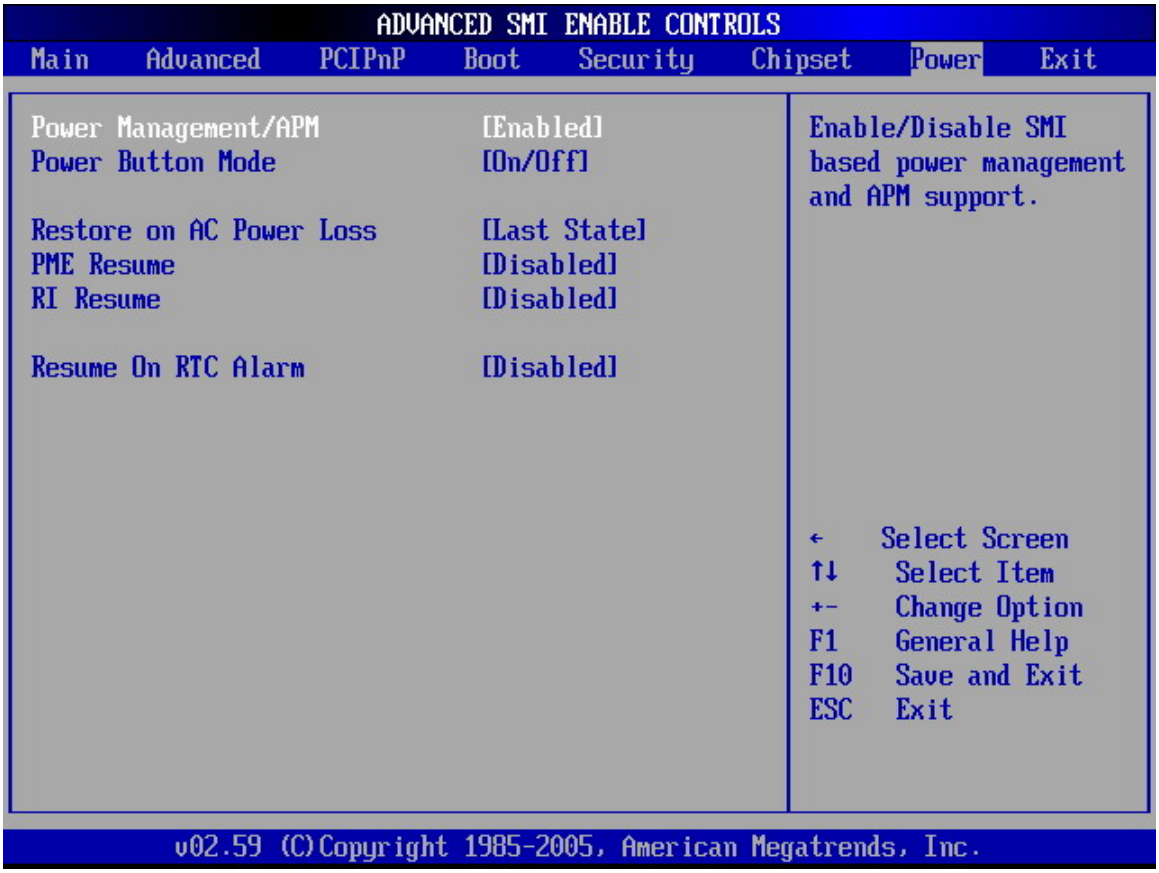
➔ **Disabled** Onboard LAN device manually disabled

➔ **Enabled** **DEFAULT** The onboard LAN device automatically detected and

enabled

6.8 Power

The **Power** menu (**BIOS Menu 20**) allows the advanced power management options to be configured.



BIOS Menu 20:Power

➔ **Power Management/APM [Enabled]**

Use the **Power Management/APM** BIOS option to enable access to the advanced power management features. If this option is disabled, the only other option on the screen is the **Power Button Mode**.

➔ **Disabled** Disables the Advanced Power Management (APM)

feature

➔ **Enabled** **DEFAULT** Enables the APM feature

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Restore on AC Power Loss [Last State]**

The Restore on AC Power Loss BIOS option specifies what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off** The system remains turned off

➔ **Power On** The system turns on

➔ **Last State** **DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **PME Resume [Disabled]**

The **PME Resume** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the PCI PME (power management event) controller.

➔ **Disabled** **DEFAULT** Wake event not generated by PCI PME controller activity

➔ **Enabled** Wake event generated by PCI PME controller activity

➔ **RI Resume [Disabled]**

The **RI Resume** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the RI (ring in) modem line. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled**	**DEFAULT**	Wake event not generated by an incoming call
➔ **Enabled**		Wake event generated by an incoming call

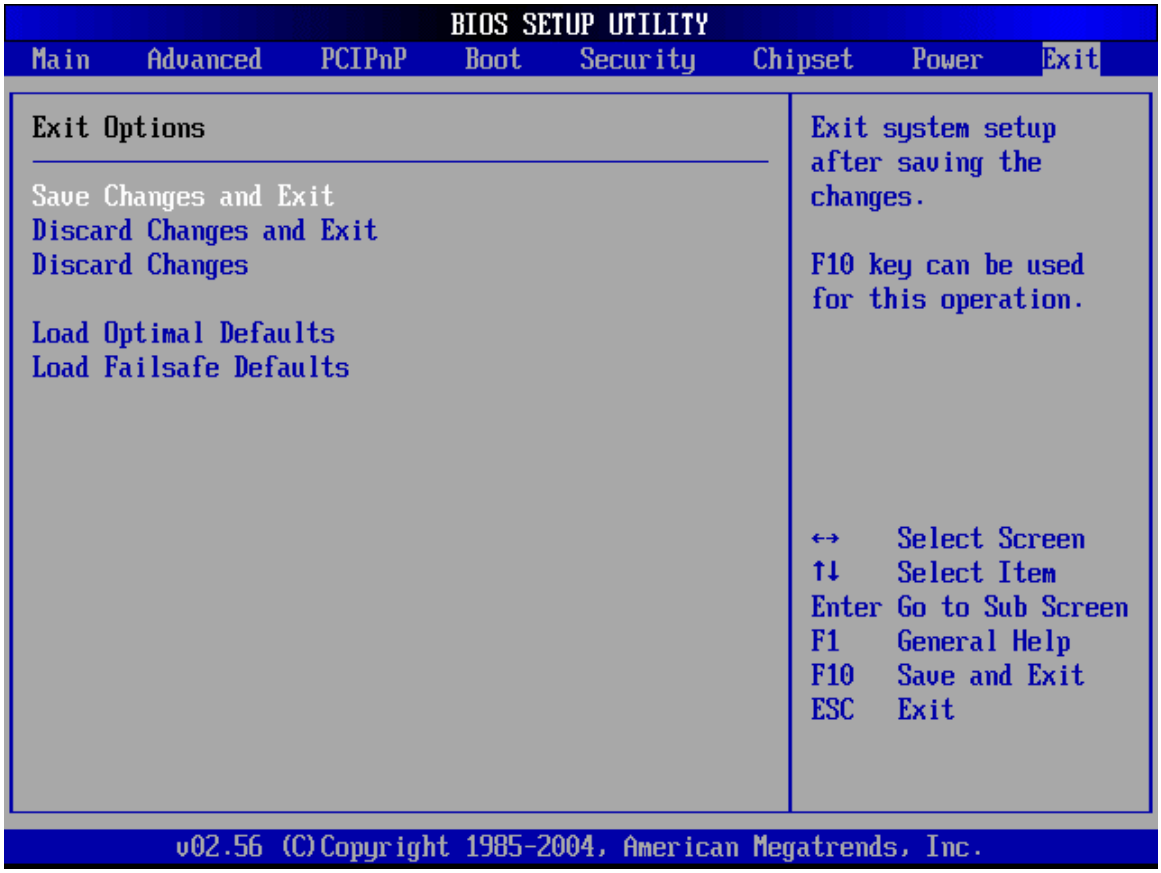
➔ **Resume On RTC Alarm [Disabled]**

The **Resume On RTC Alarm** determines when the computer will be roused from a suspended state.

➔ **Disabled**	**DEFAULT**	The real time clock (RTC) cannot generate a wake event
➔ **Enabled**		If selected, the following will appear with values that can be selected: ➔ **RTC Alarm Date (Days)** ➔ **System Time** After setting the alarm, the computer will turn itself on from a suspend state when the alarm goes off.

6.9 Exit

Use the **Exit** menu (**BIOS Menu 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 21:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Chapter

7

Software Drivers

7.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- SiS AGP
- VGA
- SIS-IDE
- AUDIO
- LAN

Installation instructions are given below.

7.2 AGP Driver Installation

To install the AGP driver, please follow the steps below:

Step 1: Insert the CD into the system that contains the KINO-6612. Open the **AGP 121** directory and locate the icon for the **Setup** installation file. Once located, use the mouse to move the cursor over the icon and double click the mouse button.

Step 2: The "**StartingInstallShield Wizard**" in **Figure 7-1**appears.

Figure 7-1: StartingInstallShield Wizard Screen

Step 3: The "**Preparing Setup**" window in **Figure 7-2** appears next.

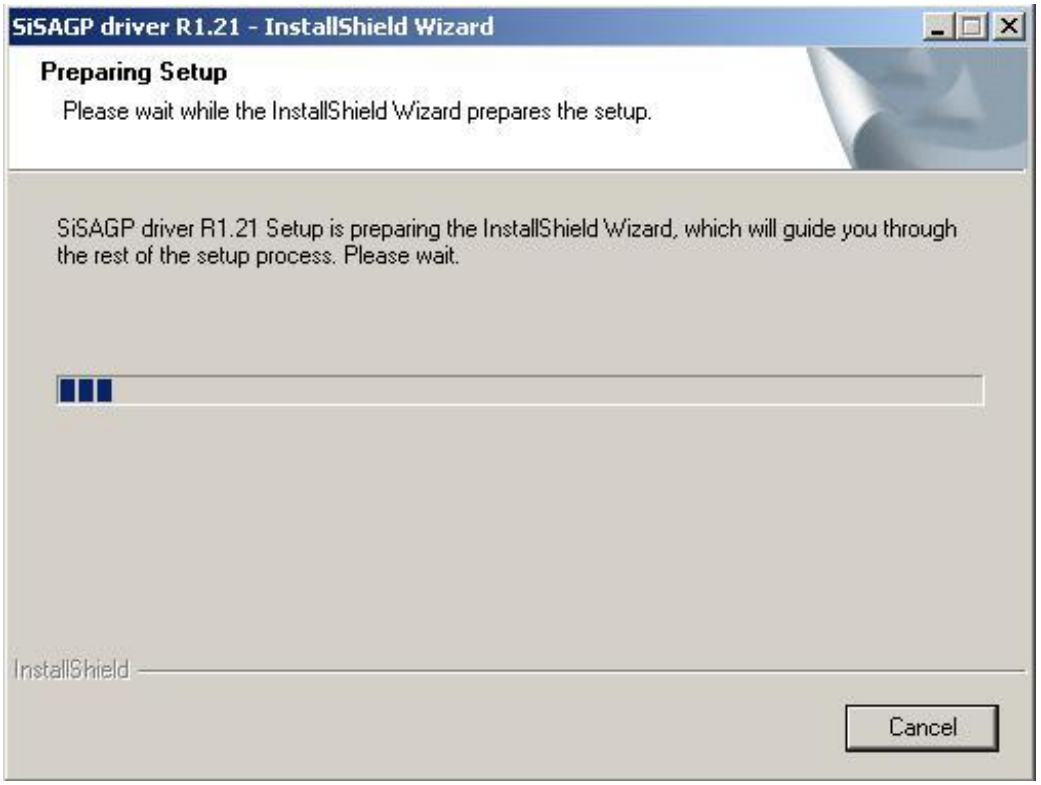


Figure 7-2: Preparing Setup Screen

Step 4: The "**Install Shield**" window in **Figure 7-3** appears next. To continue installing the AGP pack driver, click "**NEXT**."

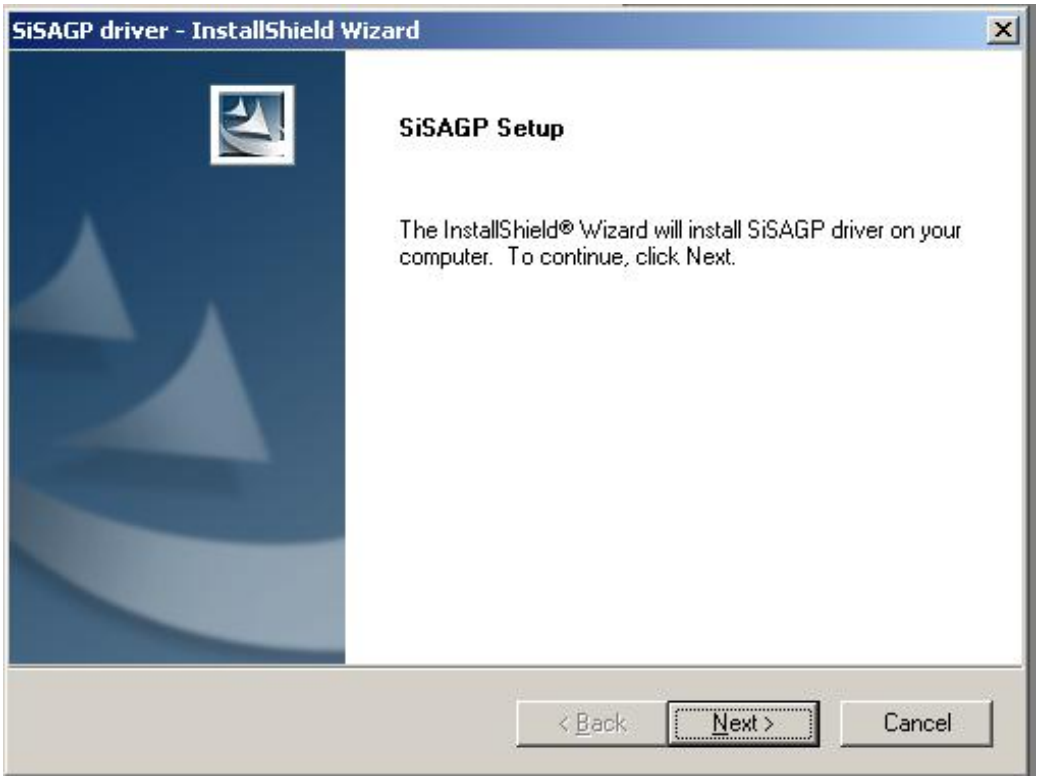


Figure 7-3: Install Shield Screen

Step 5: The installation shield starts to extract and install files as shown in **Figure 7-4**.

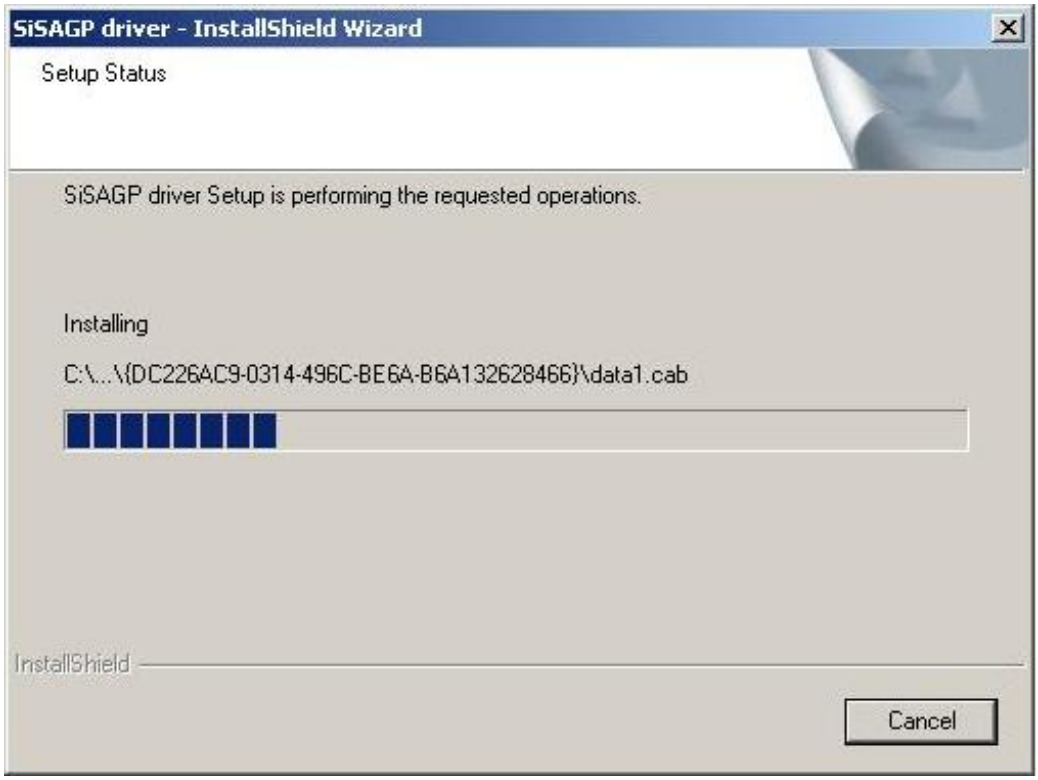


Figure 7-4: Installing Screen

Step 6: Once the installation process is complete, the computer may be restarted now or in the future. (See **Figure 7-19**). Select the preferred option and click "**FINISH**" to complete the installation process.

Figure 7-5: Restart the Computer

7.3 RealTek Audio Driver Installation

To install the RealTek AC'97 Audio driver, please follow the steps below:

Step 1: Insert the CD into the system that contains the KINO-6612. Open the CD folder and locate the **AUDIO DRIVER A3.79** directory. Open the directory and look for icon for the **setup.exe** installation file. Once located, use the mouse to move the cursor over the icon and double click the mouse button.

Step 2: Once the **Setup** icon is double clicked, the install shield wizard for the audio driver starts. See **Figure 7-6.**

Figure 7-6: Audio Driver Install Shield Wizard Starting

Step 3: The RealTek Audio Setup prepares the install shield to guide a user through the rest of the setup process. See **Figure 7-7**.

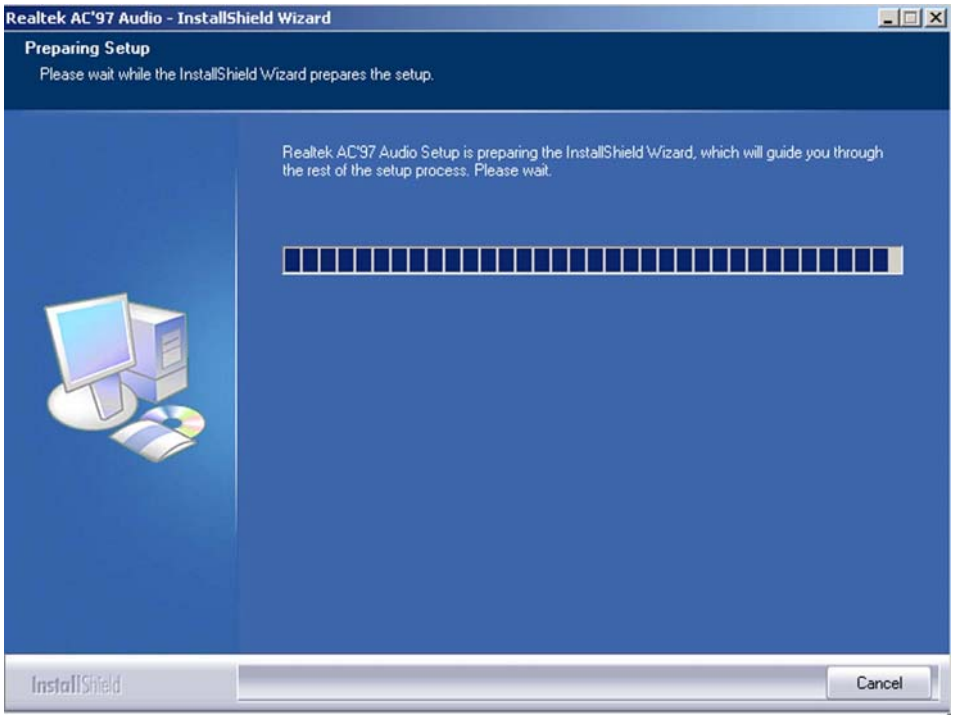


Figure 7-7: Audio Driver Setup Prerparation

Step 4: After install shield is prepared, the welcome screen shown in **Figure 7-8** appears. To continue the installation process, click the "**NEXT**" button. The install shield starts to configure the new software as shown in **Figure 7-9**.

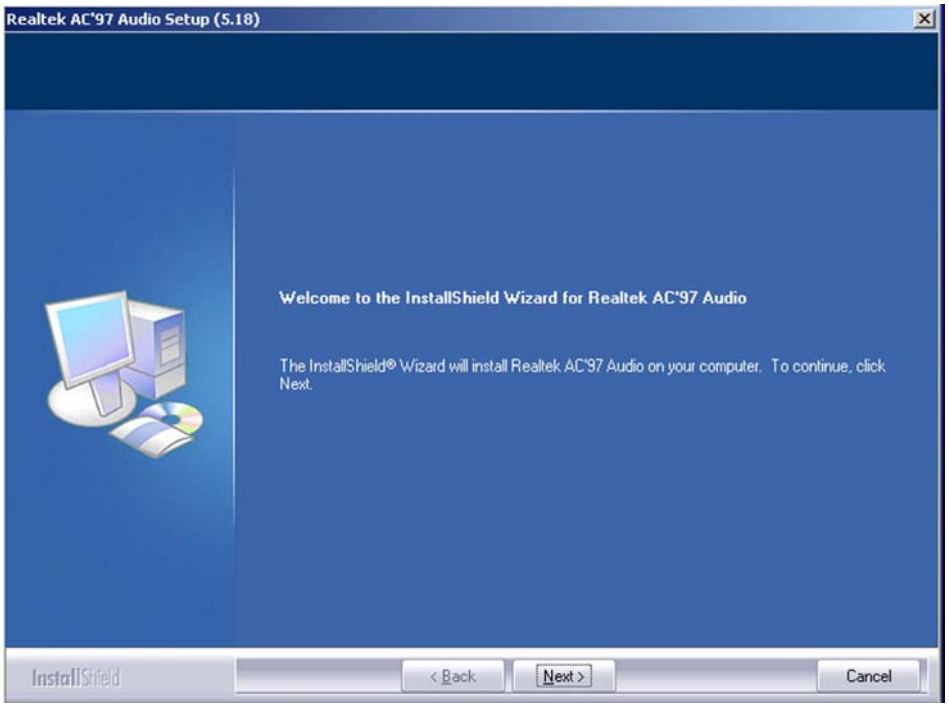


Figure 7-8: Audio Driver Welcome Screen

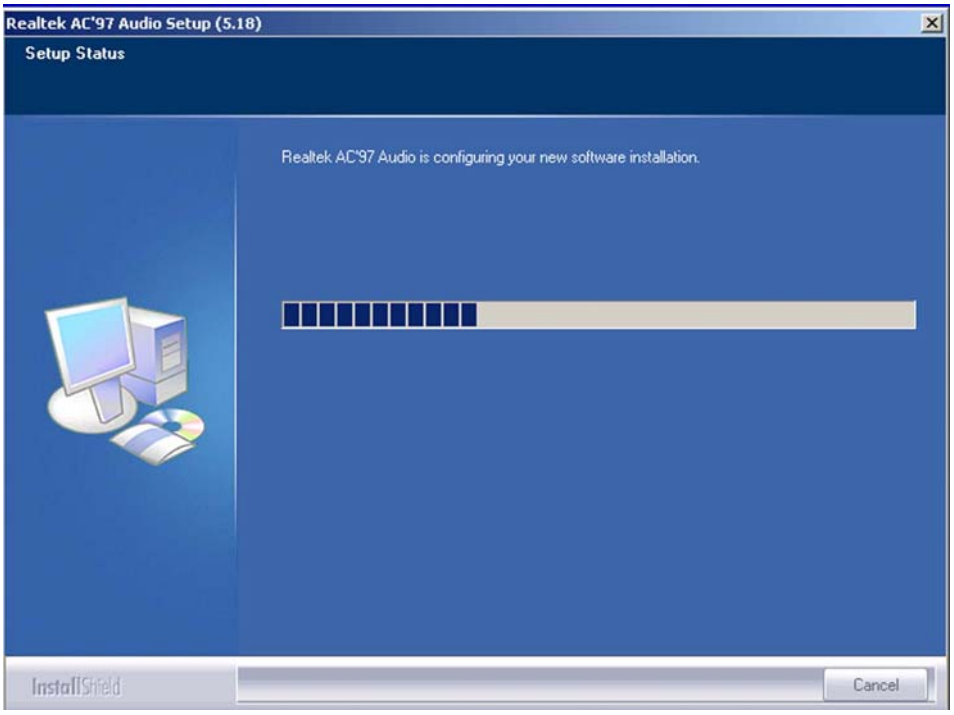


Figure 7-9: Audio Driver Software Configuration

Step 5: At this stage the "**Digital Signal Not Found**" screen shown in **Figure 7-10**

appears. To continue the installation process, click the "**YES**" button. The installation notice shown below appears.

Figure 7-10: Audio Driver Digital Signal

Step 6: At this stage the clicking the "**YES**" button in **Figure 7-10** appears, the installation of the driver begins. See **Figure 7-11**.

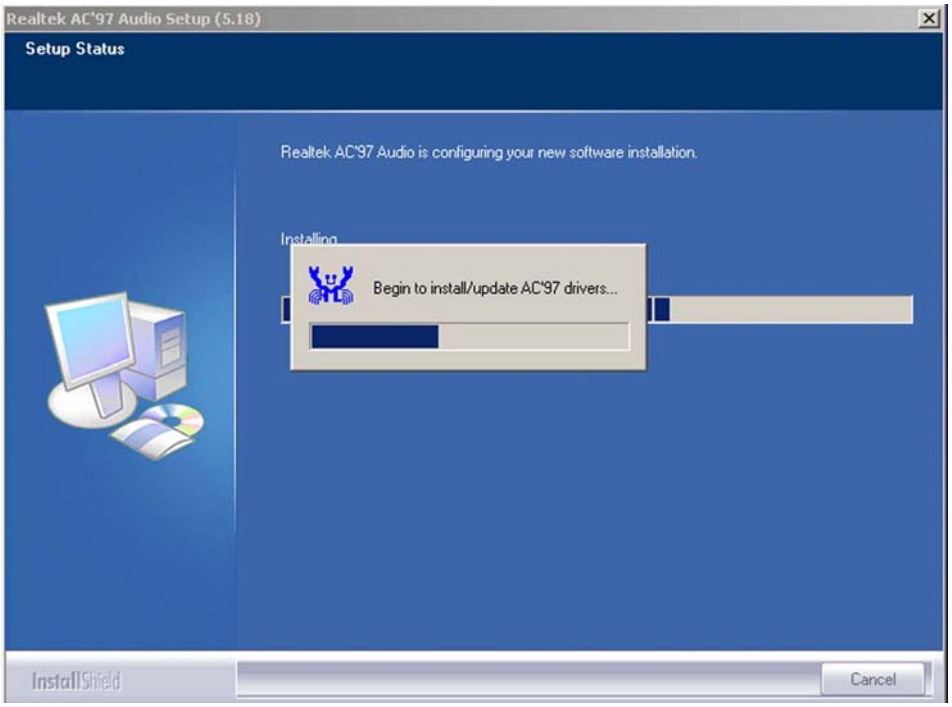


Figure 7-11: Audio Driver Installation Begins

Step 7: After the driver installation process is complete, a confirmation screen shown in **Figure 7-12** appears

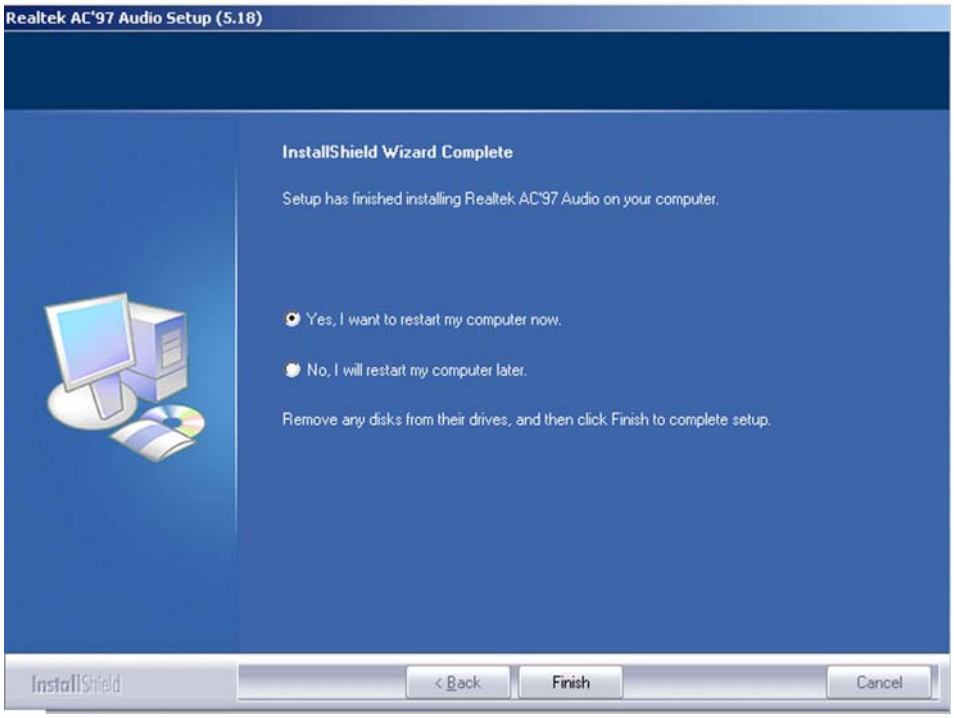


Figure 7-12: Audio Driver Installation Complete

Step 8: The confirmation screen shown in **Figure 7-12** allows the computer to be restarted immediately after the installation is complete or at a later time. For the settings to take effect the computer must be restarted. Decide when to restart the computer and click the "**FINISH**" button.

7.4 SiS VGA Utilities Driver

To install the **SiS VGA Utilities driver** in the **Chipset_VGA 3.72logo** directory please follow the steps below:

Step 1: Insert the CD into the system that contains the KINO-6612. Open the **Chipset_VGA 3.72logo** directory and locate the icon for the **setup** installation file. Once located, use the mouse to move the cursor over the icon and double click the mouse button.

Step 2: Once the **setup** icon is double clicked, a welcome screen shown in **Figure 7-13**

appears.

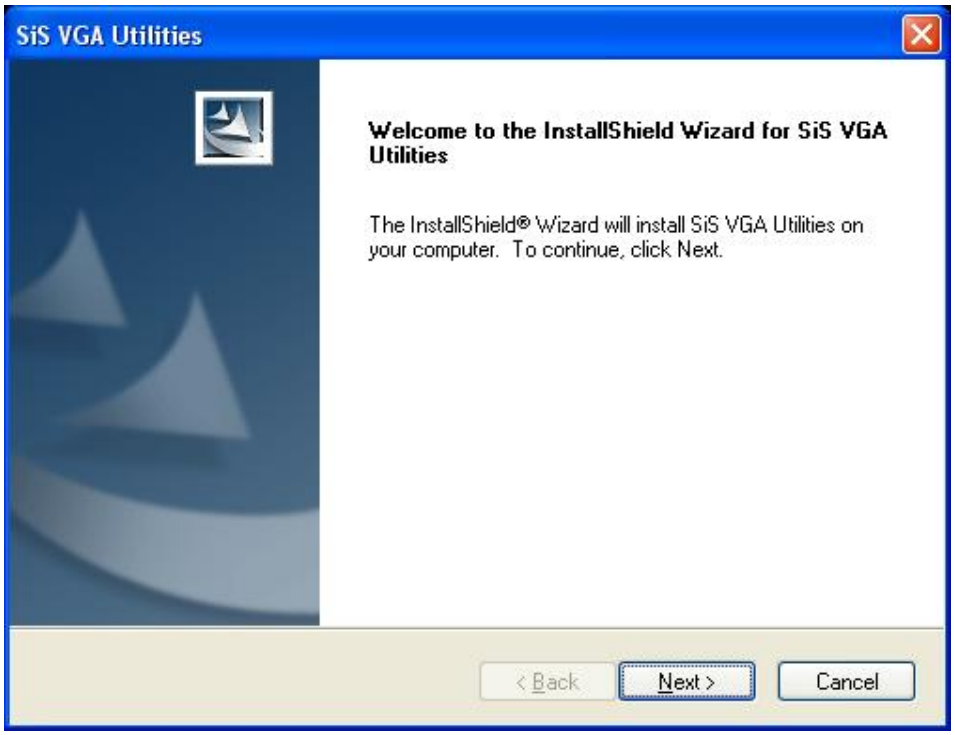


Figure 7-13: VGA Utilities Welcome Screen

Step 3: Select the setup type (see **Figure 7-14**). Once the setup type is selected, click on the **NEXT** button in the setup type menu (see **Figure 7-14**).

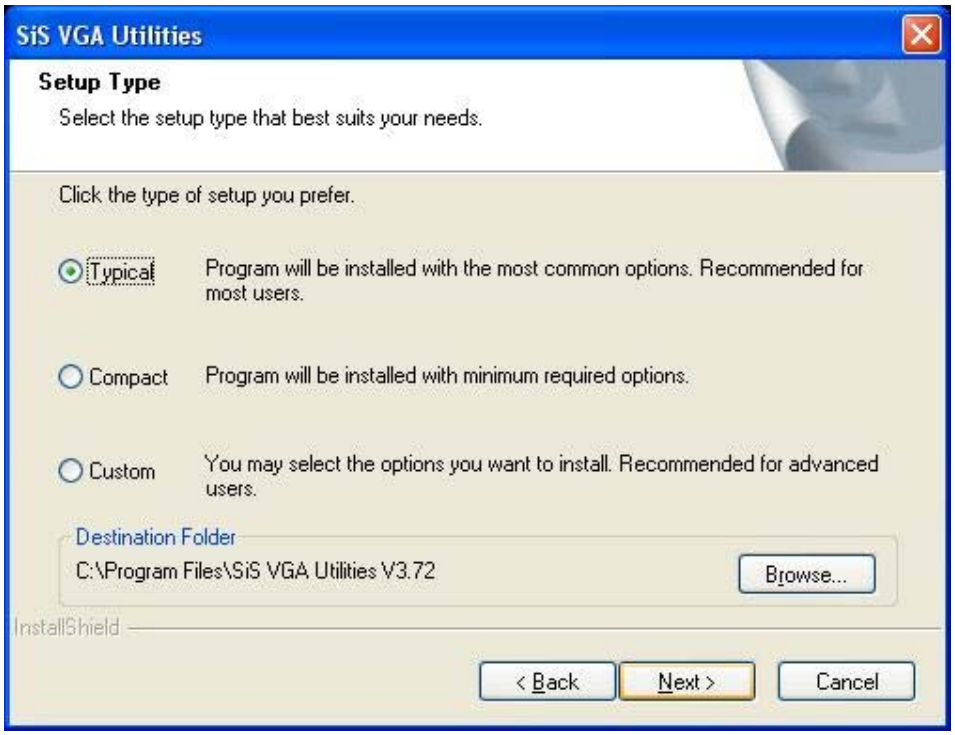


Figure 7-14: Select Setup Installation Type

Step 4: Select a folder to copy the files in (see **Figure 7-15**). Once the setup type is selected, click on the **NEXT** button.

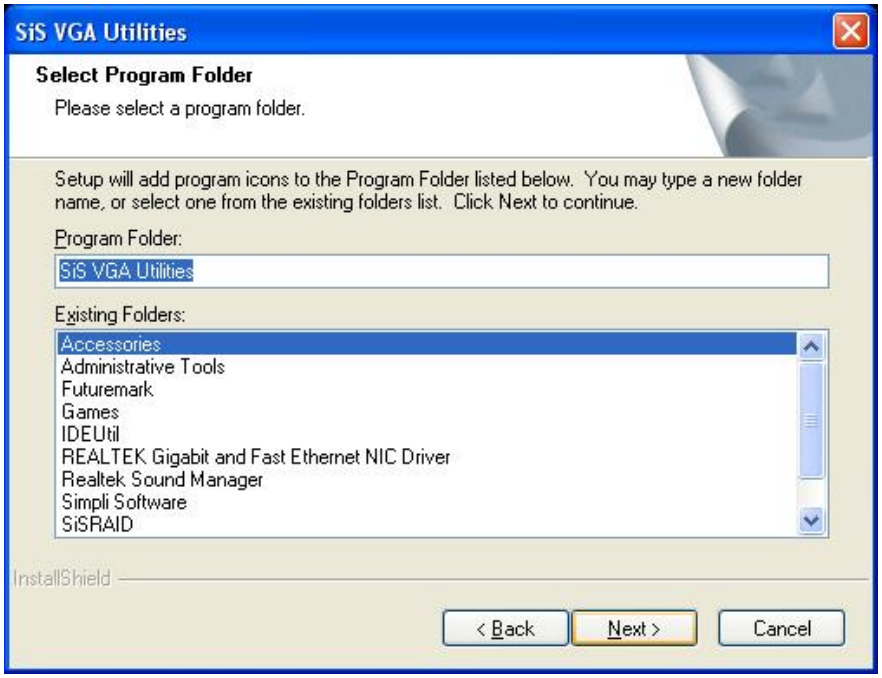


Figure 7-15: Select Folders to Copy Files

Step 5: Before the files are copied, review the selected settings (see **Figure 7-16**). To continue, click the **NEXT** button.

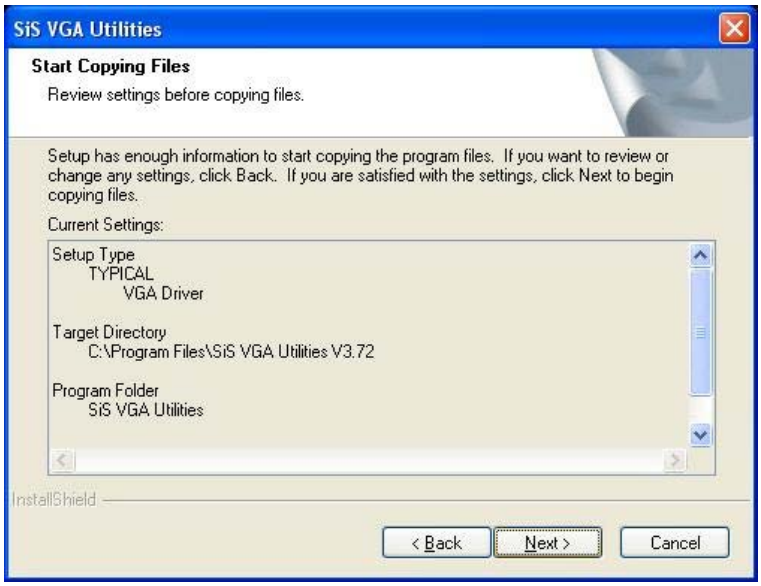


Figure 7-16: Review Settings

Step 6: The driver installation starts.

Step 7: Once the installation is complete, the user is prompted to read the Read Me file. (see **Figure 7-17**)

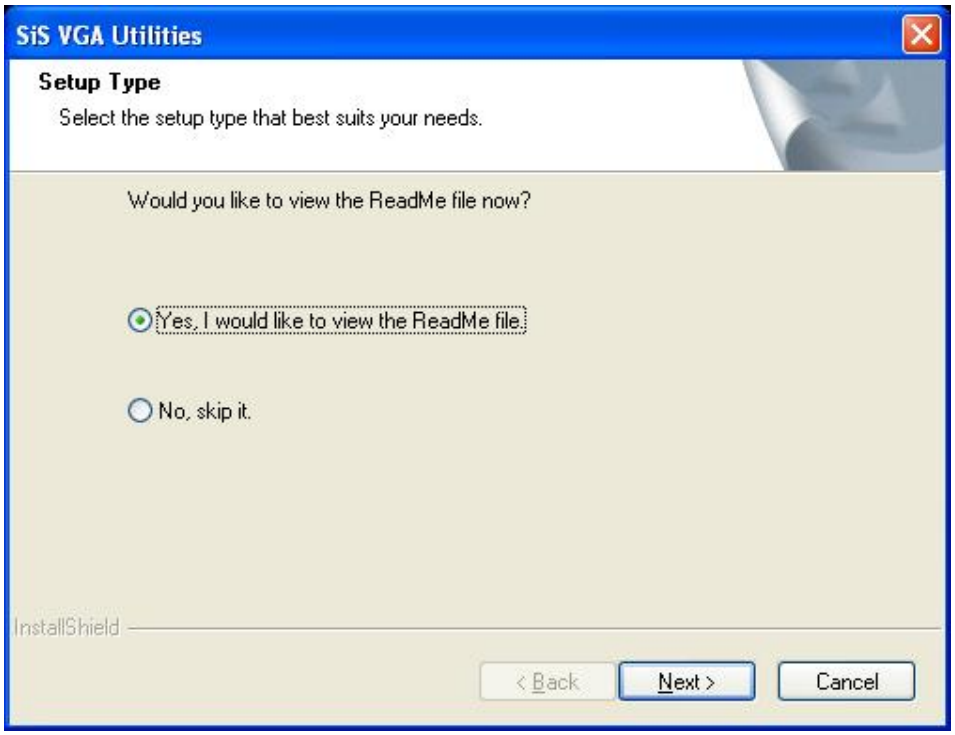


Figure 7-17: Read ReadMe File

Step 8: The user is prompted to restart the computer. Select yes or no.

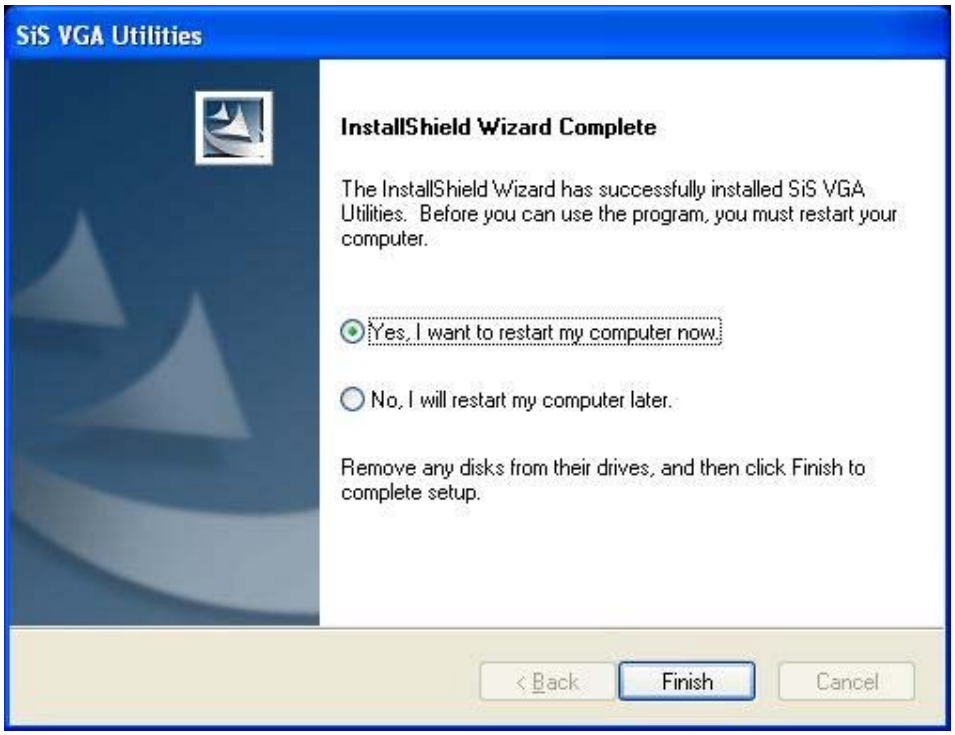


Figure 7-18: Restart the Computer

7.5 SiS IDE Driver Installation

To install the **SiS IDE driver** in the IDE R204a directory please follow the steps below:

Step 9: Insert the CD into the system that contains the KINO-6612. Open the **IDE R204a** and locate the icon for the **setup** installation file. Once located, use the mouse to move the cursor over the icon and double click the mouse button.

Step 10: Once the **setup** icon is double clicked, select a language. (See **Figure 7-19**).

Figure 7-19: Select a Language

Step 11: After a language is selected a welcome screen shown in **Figure 7-20** appears.

To continue the installation, click the "**NEXT**" button.

Figure 7-20: Welcome Screen

Step 12: Select an OS. (See **Figure 7-21**.)

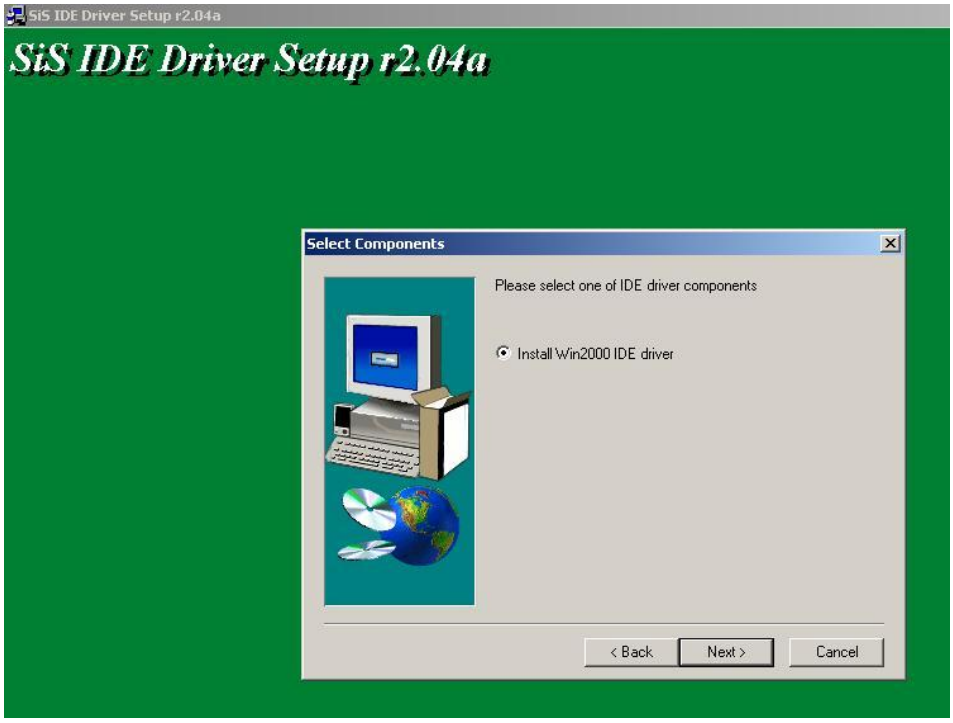


Figure 7-21: Chipset Driver Readme File Information

Step 13: Select an OS and click on the "**NEXT**" button to initiate driver installation. The installation screen shown in **Figure 7-22** appears.

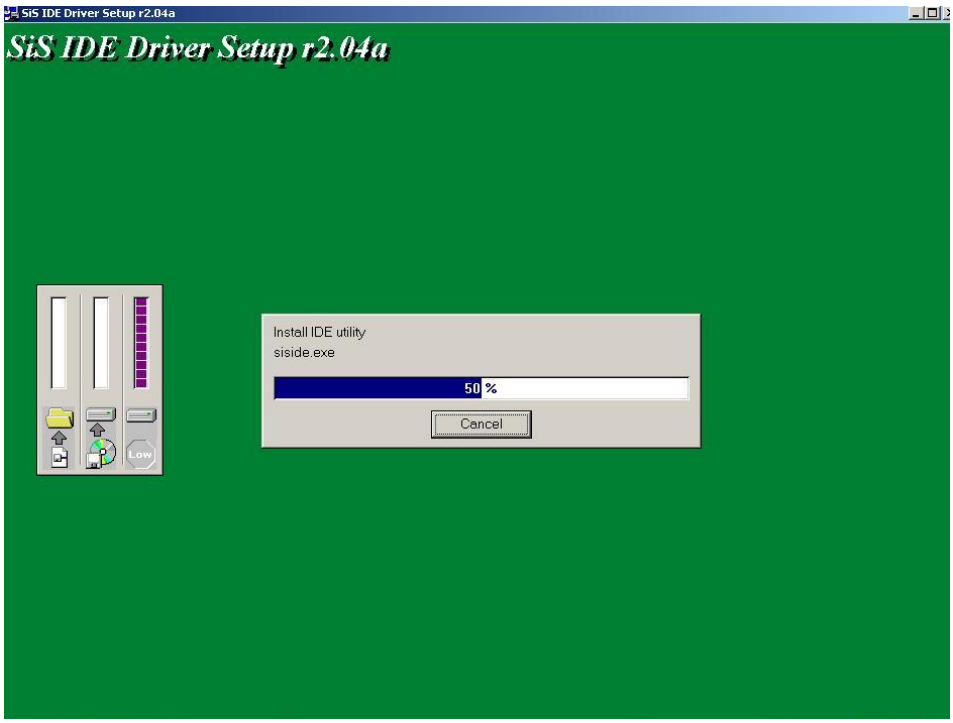


Figure 7-22: Chipset Driver Installation Complete

Step 14: After the installation is complete the user is prompted to restart the computer now or later.

7.6 LAN Driver Installation

To install the LAN driver, please follow the steps below:

Step 1: Insert the CD into the system that contains the KINO-6612driver. Open the **lan\RTL81698169S(B)8110S(B)\LanSetup_v1.80.635.051018** directory and locate the icon for the **Setup** installation file. Once located, use the mouse to move the cursor over the icon and double click the mouse button.

Step 2: Once the **Setup** icon is double clicked, a **Welcome** screen shown in **Figure 7-24** appears.

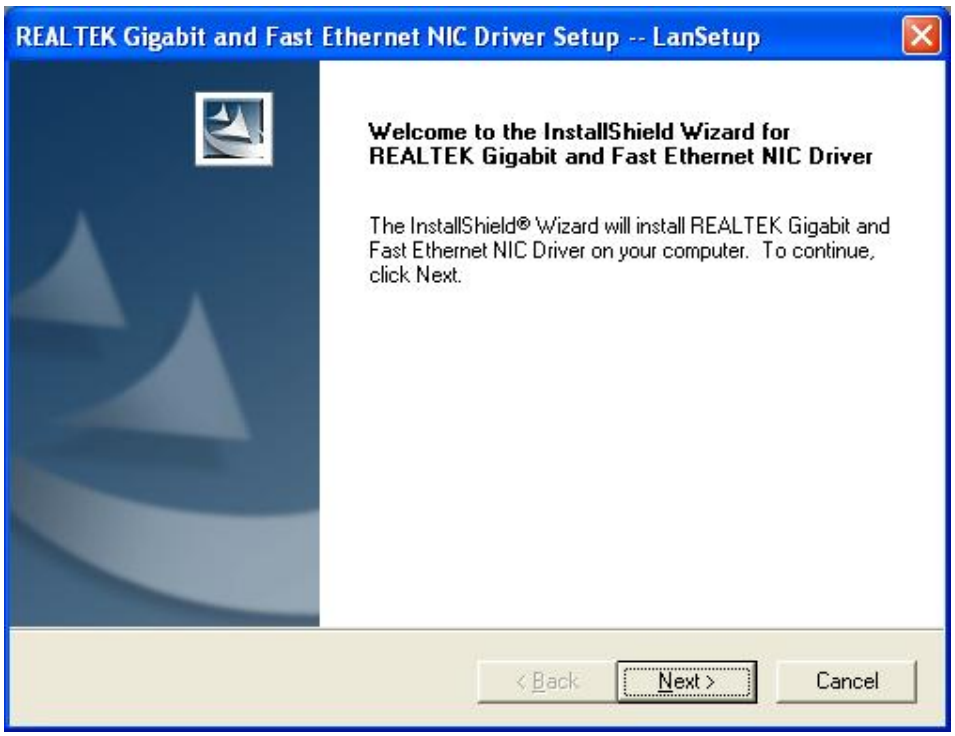


Figure 7-23: LAN Driver Welcome Screen

Step 3: To continue installing click "**Next.**" The driver is installed and a confirmation screen at the end of the installation appears. (See **Figure 7-24**)

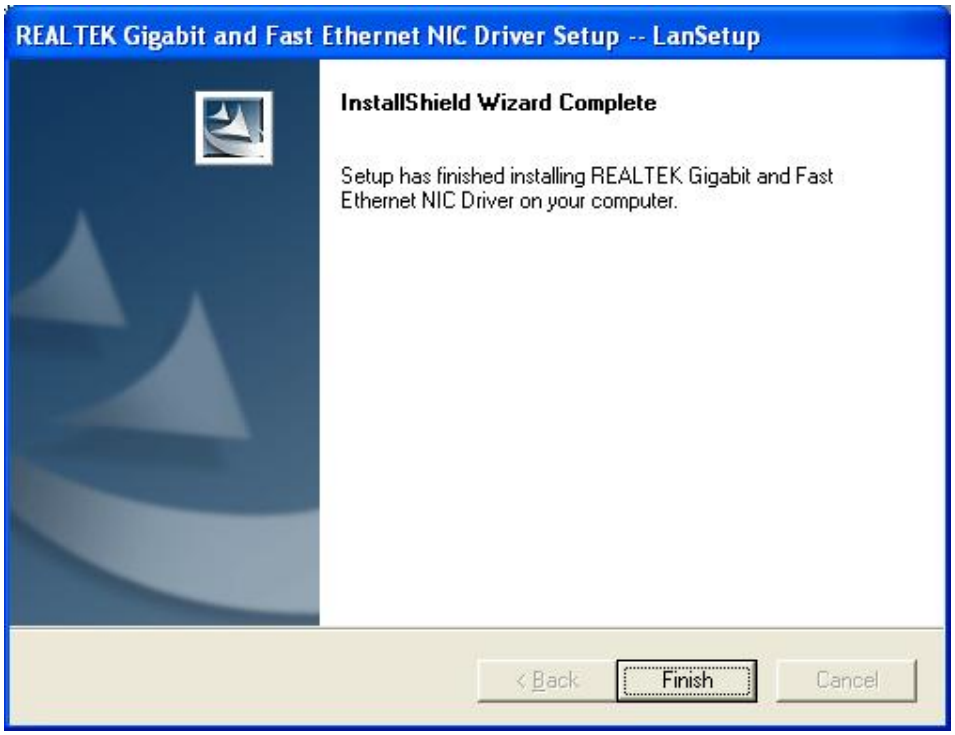


Figure 7-24: LAN Driver Installation Complete

Appendix

A

BIOS Menu Options

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Appendix

B

Terminology

AC ’97	Audio Codec 97 (AC’97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
AMD64	AMD64 enables simultaneous 32-bit and 64-bit computing with no degradation in performance. AMD64 Direct Connect Architecture connects everything directly to the CPU thereby eliminating system architecture bottlenecks.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
APM	The Advanced Power Management (APM) application program interface (API) enables the inclusion of power management in the BIOS.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.

CMOS	Complimentary metal-oxide-conductor is a type of integrated circuit used in chips like static RAM and microprocessors.
COM	COM is used to refer to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DE-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.

L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
MAC	The Media Access Control (MAC) protocol enables several terminals or network nodes to communicate in a LAN, or other multipoint networks.
SiS MuTIOL® 1G	A 1.0 GBps bus bi-directional 16-bit data bus with an operating frequency of 533MHz that connects an SiS Northbridge chipset to an SiS Southbridge chipset.
PCIe	PCI Express (PCIe) is a communications bus that uses dual data lines for full-duplex (two-way) serial (point-to-point) communications between the SBC components and/or expansion cards and the SBC chipsets. Each line has a 2.5 Gbps data transmission rate and a 250 MBps sustained data transfer rate.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
QVGA	Quarter Video Graphics Array (QVGA) refers to a display with a resolution of 320 x 240 pixels.
RAID	Redundant Array of Inexpensive Disks (RAID) refers to redundantly backing up data on multiple disks to ensure that if one disk fails, the data is not lost and can be restored from the remaining disks in the array.
RAM	Random Access Memory (RAM) is a form of storage used in computer. RAM is volatile memory, so it loses its data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data

	transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates, while USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

DIO Interface

C.1 DIO Interface Introduction

The DIO connector on the KINO-6612 is interfaced to GPIO ports on the Winbond W83697HG Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the Winbond W83697HG Super I/O chipset.

C.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Input 0	GP10	General purpose I/O port 1 bit 0.
4	Input 1	GP11	General purpose I/O port 1 bit 1.
5	Input 2	GP12	General purpose I/O port 1 bit 2.
6	Input 3	GP13	General purpose I/O port 1 bit 3.
7	Output 0	GP14	General purpose I/O port 1 bit 4.
8	Output 1	GP15	General purpose I/O port 1 bit 5.
9	Output 2	GP16	General purpose I/O port 1 bit 6.
10	Output 3	GP17	General purpose I/O port 1 bit 7.

C.3 Assembly Language Samples

C.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

```
MOV     AX, 6F08H       Sets the digital port as input
INT     15H             Initiates the INT 15H BIOS call
```

C.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

```
MOV     AX, 6F09H       Sets the digital port as output
MOV     BL, 09H
INT     15H             Initiates the INT 15H BIOS call
```

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

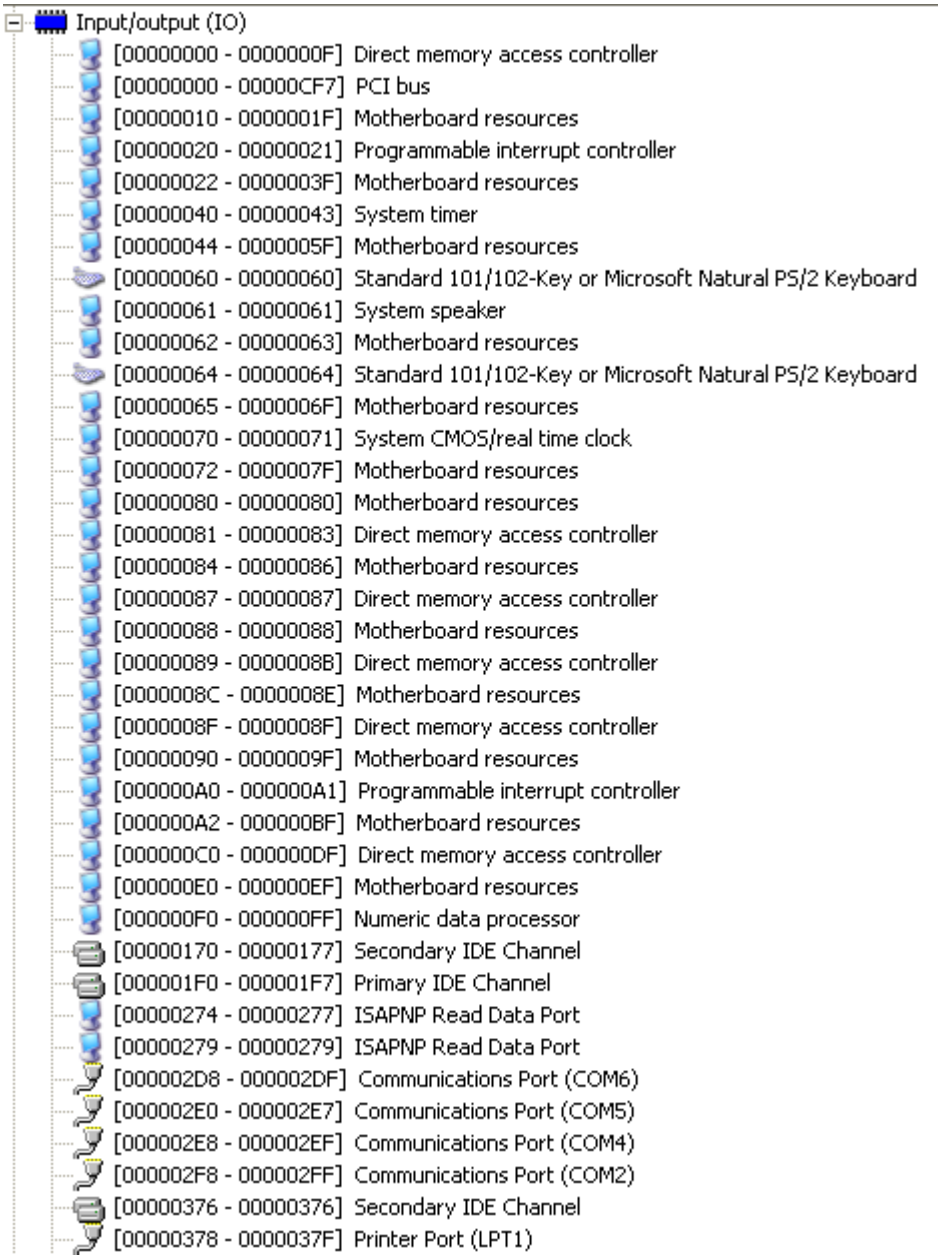
```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30                  ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1             ;is the application over?
        JNE       W_LOOP        ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

Appendix

E

Address Mapping

E.1 I/O Address Map



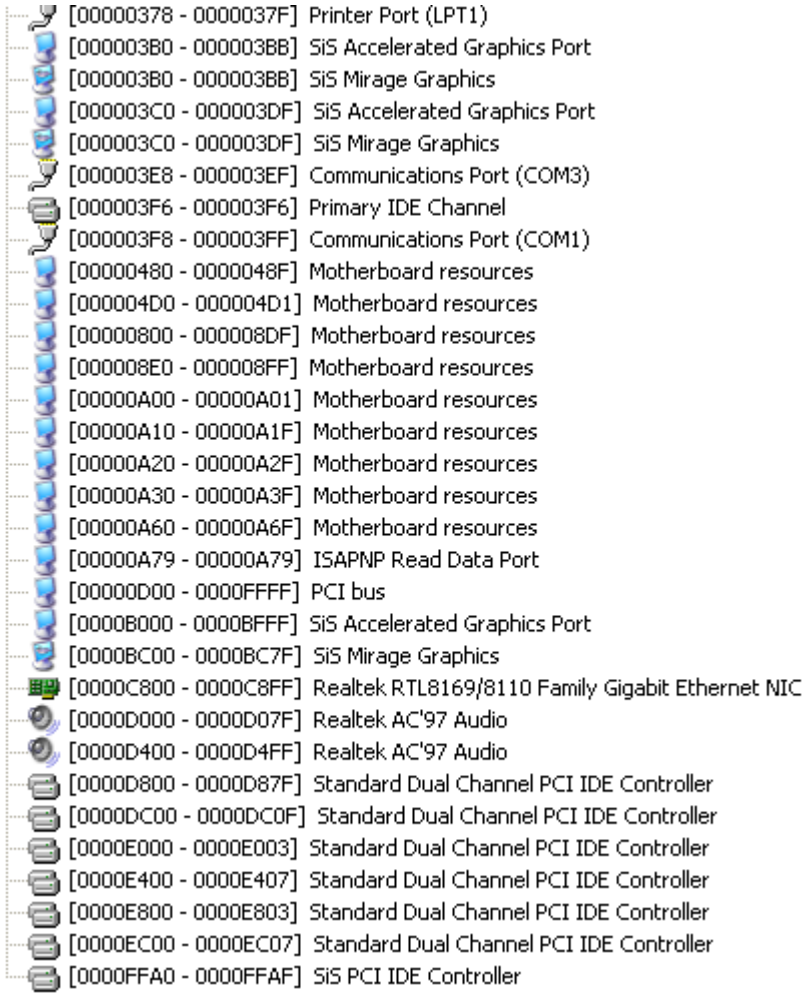


Table E-1: IO Address Map

E.2 IRQ Address Map

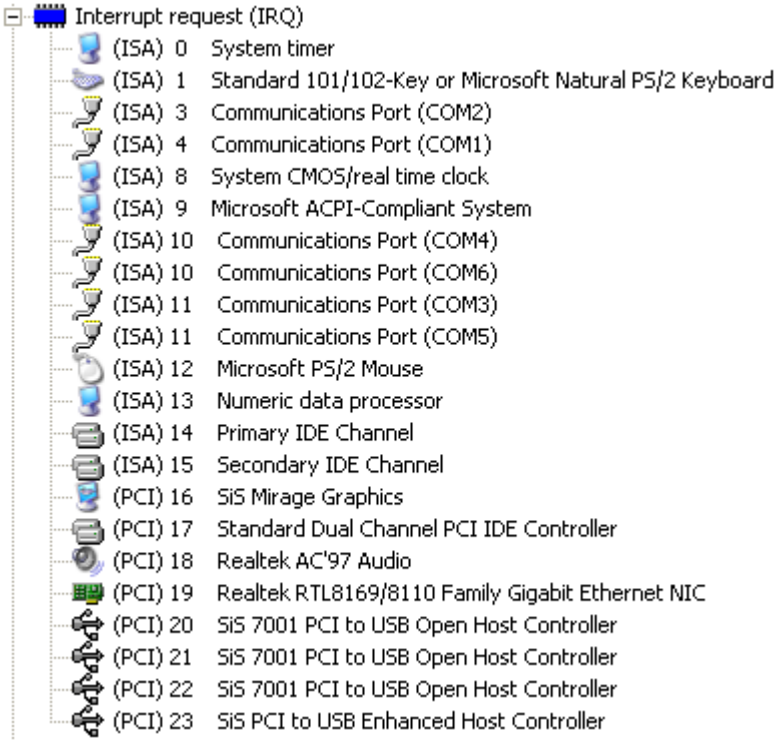


Table E-2: IRQ Address Map

E.3 Memory Address Map

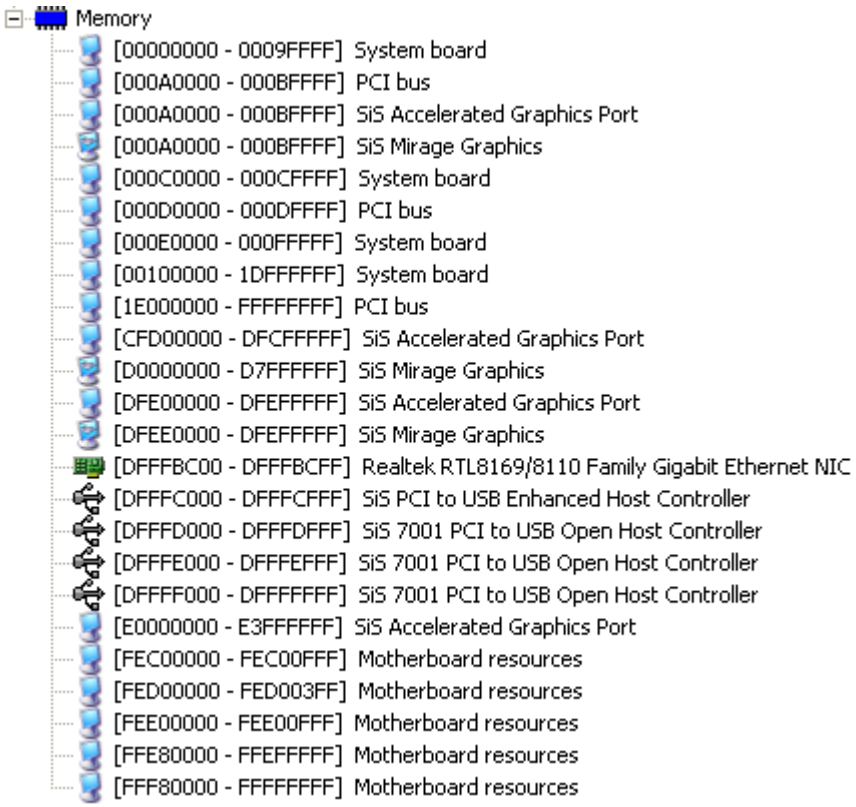


Table E-3: IRQ Address Map

Appendix

F

Compatibility

NOTE:

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the KINO-6612

F.1 Compatible Operating Systems

The following operating systems have been successfully run on the KINO-6612.

- MS-DOS 6.22
- Microsoft Windows Server 2003 (32-bit)
- Microsoft Windows Server 2003 (64-bit)
- Microsoft Windows Vista (32-bit)
- Microsoft Windows Vista (64-bit)
- Microsoft Windows XP (32-bit)
- Microsoft Windows XP (64-bit)
- Microsoft Windows 2000
- WinPOS (XPE)
- QNX Neutrino ver. 6.2.1
- Fedora Core 7
- Mandriva Linux 2006
- Mandriva Linux 2007

F.2 Compatible Processors

The following Socket AM2 processors have been successfully tested on the KINO-6612

CPU	Model Number	Frequency	L2 Cache
AMD Athlon™ 64 X2 Dual-Core	5200+	2.6 GHz	2 MB
AMD Athlon™ 64 X2 Dual-Core	5000+	2.6 GHz	1 MB

AMD Athlon™ 64 X2 Dual-Core	4800+	2.4 GHz	1 MB
AMD Athlon™ 64 X2 Dual-Core	4200+	2.1 GHz	1 MB
AMD Athlon™ 64 X2 Dual-Core	3400+	1.8 GHz	1 MB
AMD Athlon™ 64	3500+	2.2 GHz	512 KB
AMD Athlon™ 64	3200+	2.0 GHz	512 KB
AMD Sempron™	3600+	2.0 GHz	256 KB

F.3 Compatible Memory Modules

Note:

The memory modules listed below have been tested on the KINO-6612 other memory modules that comply with the specifications may also work on the KINO-6612 but have not been tested.

The following memory modules have been successfully tested on the KINO-6612.

Manufacturer	Model No.	Capacity	Speed
CORSAIR	64M8CFEG PS0900702	1 GB	667 MHz
CORSAIR	64M8CFEG EL1000617	512 MB	667 MHz
Kingston	KHX5400D2K2/1G	512 MB	667 MHz
Kingston	KVR667D2E5/512	512 MB	667 MHz
Kingston	KVR800D2E5K2/1G	512 MB	800 MHz
Twinmos	ELPIDA E5116AB-5C-E	256MB	PC2-4300 U-DIMM/CL4
Elixir	N2TU51280AF-37B	512MB	PC2-4200U
Apacer	ELPIDA E5108AG-8E-E	1GB	PC2-5300
KINGSTEK	KST3216533-612MP	256MB	533 MHz
KINGSTEK	Elixir N2TU51280AE-37B	512MB	533 MHz
KINGSTEK	KST648533-612LA	1GB	533 MHz
KINGSTEK	KKEA88B4LAUG-37DX	512MB	533 MHz
Hynix	Hy5PS56821 FP-C4	256MB	533 MHz
Hynix	Hy5PS12821 PH-C4	512MB	533 MHz

Appendix

G

Hazardous Materials Disclosure

G.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	x	O	O	O	O	x
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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